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Towards Improved Dermatological Care: Evaluation of Histoclinical Concordance in Yaounde over a Decade

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Abstract

Introduction—Cutaneous pathologies constitute a major public health problem in Cameroon. The purpose of this study was to evaluate the concordance rate between clinical and histopathological diagnoses at *Centre Pasteur du Cameroun* (*CPC*) in Yaounde from 2012 to 2021. **Methodology—**A descriptive cross-sectional study with retrospective data collection was conducted at the Anatomy and Cytopathology laboratory of the CPC. All patient files with cutaneous biopsies examined in that laboratory with clinical information and diagnoses were included. Quantitative variables were expressed as means with their standard deviation, and qualitative variables as frequencies and percentages. The anatomopathological and clinical concordance rate was studied using the Kappa coefficient. A p-*value* < 0.05 was considered statistically significant. **Results—**A total of 2037 cutaneous biopsies were analyzed, with a mean age of 40.9 ± 19.4 years. The majority of specimens studied in the laboratory were performed by dermatologists (32%). The most commonly used sampling method was punch biopsy (46.9%), and the most frequent locations were the lower extremities (37.3%). The overall concordance rate was 67.9% (total concordance: 45.2%, partial concordance: 22.7%), with a predominance of overall

concordance rate for tumoral and infectious dermatoses. **Conclusion—**At the conclusion of our study, which aimed to determine the concordance rate between clinical and histopathological diagnoses at the Pasteur Center of Cameroon in Yaounde from 2012 to 2021.

Keywords

Concordance, Dermatopathology, Yaounde, Histoclinical

1. Introduction

Effective management of dermatological pathologies requires good cohesion between the anatomopathologist and the clinician. Thus, one of the barometers used to assess this association is the evaluation of concordance between diagnoses suggested by the clinician and the histological diagnosis obtained in the laboratory [1]. The term concordance, according to the Larousse dictionary, refers to the fact of agreeing or being in agreement [2]. It can be influenced either by the sampling method (punch biopsy being the best), the sampling site, or finally the preservation method [3].

A retrospective study conducted in Saudi Arabia in 2019 showed an overall concordance rate of 75.9% on 4268 biopsies, with a partial concordance rate of 47.6% for differential diagnosis and 13.5% non-concordance [3]. In sub-Saharan Africa, the subject of histoclinical concordance is not current, although cutaneous conditions constitute one of the main causes of morbidity in developing countries.

In Cameroon, cutaneous pathologies constitute a major public health problem. Indeed, following the 4th specific objective of the national strategic plan for disease prevention, which is to ensure surveillance of certain pathologies such as yaws, leishmaniasis, leprosy, and Buruli ulcer [4], and according to current data at our disposal, no descriptive study in dermatopathology has yet been conducted. In this regard, given the recurrent cutaneous problems and increasing exposure factors, we proposed to conduct a study aimed at evaluating the concordance rate between clinical and histopathological diagnoses at the CPC in Yaounde from 2012 to 2021.

2. Methodology

We conducted a descriptive cross-sectional study with retrospective data collection at the Anatomy and Cytopathology laboratory of the CPC over a period of 7 months. The CPC is an organization of the Ministry of Public Health of Cameroon, a public administrative establishment endowed with financial autonomy and legal personality.

In the period extending from January 2012 to December 2021, we included all patient files with cutaneous samples examined at the Anatomy and Cytopathology

laboratory that had clinical information and diagnoses mentioned. We excluded all patient files that did not have clinical diagnoses mentioned.

Quantitative variables were expressed as means ± standard deviation and qualitative variables as frequencies and percentages. The variables used were sociodemographic characteristics (age, sex), clinical data (variables on clinical aspects, evolution, type of dermatosis, type of sampling, sampling site, preservation), histological data (variables on staining, immunohistochemistry, type of dermatosis), and concordance data (total, partial, and non-concordance).

Concordance data were interpreted as follows:

- **For variables of different types**: data on the type of dermatosis, diagnoses made by the clinician and anatomopathologist, and concordance were recorded in the data entry form as follows.
  - When the histological diagnosis corresponded to the main clinical diagnosis, we spoke of **total concordance** [3] [5].
  - When the histological diagnosis corresponded to the differentials, we spoke of **partial concordance** [3] [5].
  - When the histological diagnosis corresponded neither to the main diagnosis nor to the differential diagnoses, we spoke of **non-concordance** [3] [5].
  - When one of the diagnoses suggested by the clinician corresponded to the histopathological diagnosis, we spoke of **histoclinical or anatomoclinical concordance** [3] [4].
  - **Overall concordance:** total concordance + partial concordance [3].
- **For the same type of variables**, the Kappa coefficient was used to calculate the concordance rate.

After obtaining administrative authorizations, we conducted a retrospective collection and review of patient files in the GLIMS software of the CPC according to our inclusion and exclusion criteria. Then, we collected information related to our work using the data collection form.

3. Results

A total of 2037 patient files were collected. Among these files, only 1325 had clinically mentioned diagnoses, thus allowing evaluation of the concordance rate between clinical and histological diagnoses.

3.1. Sociodemographic Characteristics

The mean age of our distribution was 40.9 ± 19.4 years, with extremes of 0 and 95 years. The modal age group was 30 to 45 years (**Figure 1**). The M/F sex ratio was equal to 1.04.

3.2. Clinical Data

The majority of specimens studied in the laboratory, 32%, were examined by dermatologists (**Table 1**).

Punch biopsy was the most commonly used sampling method in our distribu-

tion (46.9%), followed by scalpel biopsy (26.5%) and excisional biopsy (26.1%) (Figure 2).

The choice of sampling site was varied in this distribution, with the most frequent being the lower extremities (37.3%) and the least represented being the perineum (4.7%) (Figure 3).

Of the 2,037 patient files, 712 lacked clinical information, representing 34.9%. Knowing that a file could have an association of several elementary lesions, the most represented was ulceration (28%) (Table 2).

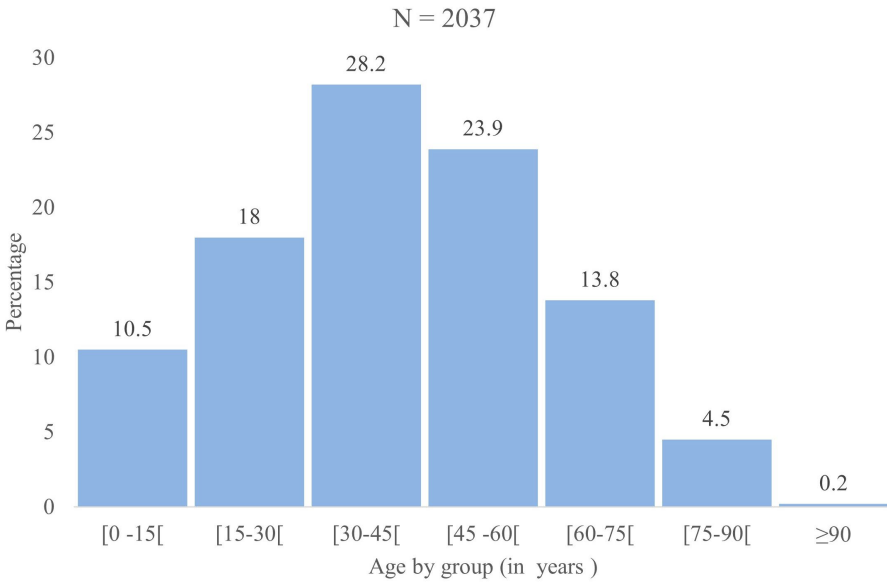

Figure 1. Distribution of subjects by age group.

Table 1. Proportion of cutaneous biopsies according to hospital practitioners who performed the samplings.

Practitioner Specialty	Number (N = 2037)	Frequency (%)
Dermatologist	652	32
Other unspecified specialties	601	29.5
Surgeon	341	16.7
MSF	171	8.4
General practitioner	136	6.7
ENT	42	2.1
Gynecologist	25	1.2
Medical biologist	25	1.2
CPC (Douala, Garoua)	21	1.1
Pediatrician	4	0.2
Infectious disease specialist	8	0.4
Cardiologist	6	0.3
Oncologist	5	0.2

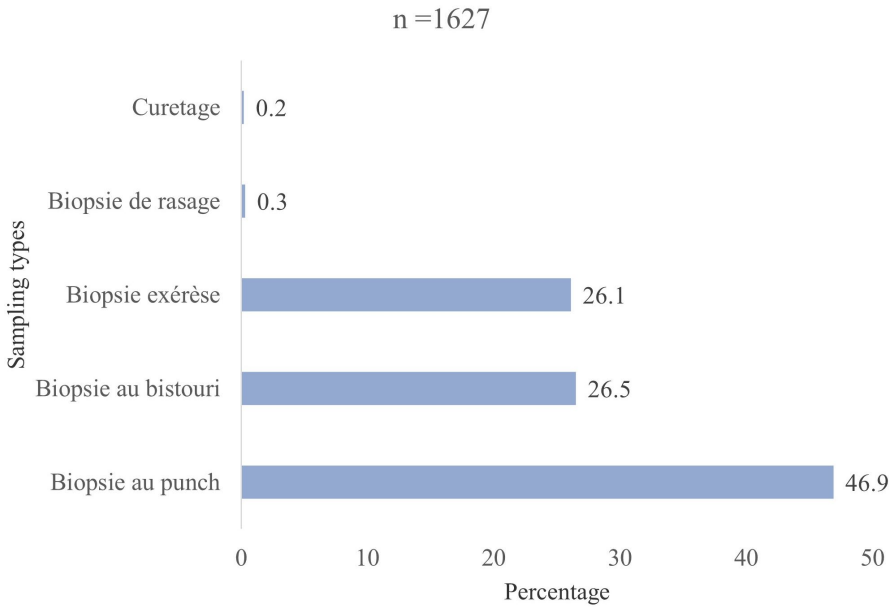

Figure 2. Sample types.

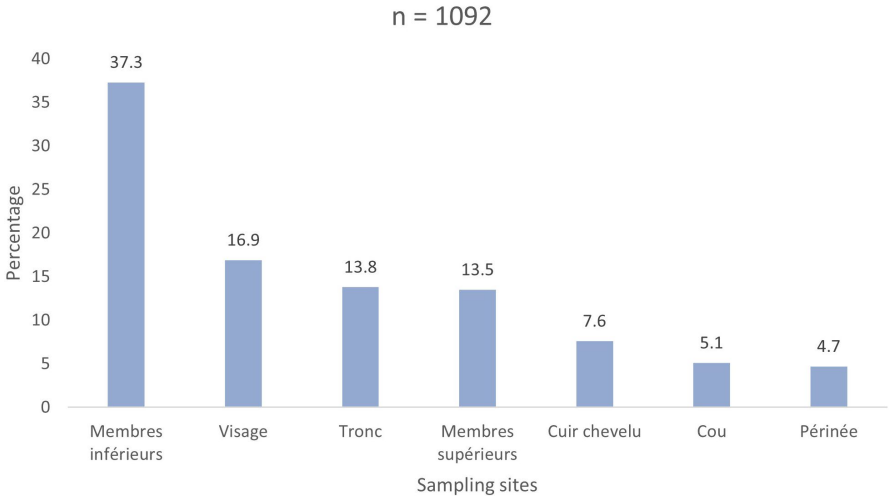

Figure 3. Sampling sites.

Table 2. Clinical aspects.

Clinical aspects	Number (n = 1362)	Frequency (%)
Ulceration	382	28.0
Nodule	227	16.7
Papule	133	9.8
Erythema	126	9.3
Plaques	123	9
Scales	93	6.8
Macule	52	3.8
Pruritus	52	3.8

Continued

Keratosis	27	2
Bulla	25	1.8
Vesicle	18	1.3
Pustule	13	1
Atrophy	11	0.8
Erosion	3	0.2

The evolution of most dermatological lesions was most often chronic (79.3%), and the most used preservative was 10% buffered formalin (99.3%). Among the diagnoses suggested by the clinician, there was a predominance of benign tumoral dermatoses (26.4%), followed by infectious dermatoses (23.0%) (Table 3).

Table 3. Clinical diagnoses mentioned.

Types of dermatoses	Number (n =1325)	Frequency (%)
Benign tumoral dermatoses	350	26.4
Infectious dermatoses	305	23.0
Inflammatory and autoimmune dermatoses	294	22.2
Malignant tumoral dermatoses	224	16.9
Vascular dermatoses	94	7.1
Genodermatoses	29	2.2
Storage dermatoses	7	0.5
Dermatoses of hair follicles and appendages	4	0.3
Other cutaneous conditions	18	1.4

3.3. Histopathological Data

Hematoxylin and eosin staining was the only routine staining used, and Ziehl-Nielsen was the most commonly used specific staining for the detection of acid-fast bacilli (AFB) (Table 4). Despite the prescription of immunohistochemistry, only 13 could be performed. CD20 (46.1%) and CD3 (30.8%) were the most commonly used tumor markers, mainly for the diagnosis of cutaneous lymphomas (Table 5). The histological results of cutaneous specimens showed a predominance of benign tumoral dermatoses (26.8%), followed by malignant tumoral dermatoses (23.1%) (Table 6).

Table 4. Stains used.

Stains	Number (N = 2037)	Frequency (%)
Routine staining		
Hematoxylin and eosin	2037	100
Specific staining		

Continued

Ziehl-Nielsen	47	2.3
Gomori-Grocott	36	1.8
PAS	19	0.9
Giemsa	10	0.5
Congo Red	1	0.0

Table 5. Immunohistochemistry.

Antibodies	Number (n = 13)	Frequency (%)
CD20	6	46.1
CD3	4	30.8
CD30	1	7.7
Ki67	1	7.7
MELANA	1	7.7

Table 6. Histological diagnoses.

Types of dermatoses	Number (N = 2037)	Frequency (%)
Benign tumoral dermatoses	545	26.8
Malignant tumoral dermatoses	470	23.1
Inflammatory and autoimmune dermatoses	424	20.8
Infectious dermatoses	272	13.4
Vascular dermatoses	198	9.7
Genodermatoses	67	3.3
Diseases of hair follicles and skin appendages	6	0.3
Storage dermatoses	1	0.0
Other cutaneous conditions	54	2.7

3.4. Concordance Data

The concordance rate for infectious dermatoses is shown in Table 7 according to the types of dermatoses (bacterial, viral, fungal, parasitic). We noted a higher overall concordance rate for bacillary angiomatosis (100%), leprosy (83.3%), and Buruli ulcers (72.7%).

Table 7. Evaluation of concordance rate for infectious dermatoses.

Infectious dermatoses	Total concordance (%) (n = 90)	Partial concordance (%) (n = 108)	Non-concordant (%) (n = 107)	Total (n = 305)
Bacterial dermatoses				
Buruli ulcer	55 (28.4)	86 (44.3)	53 (27.3)	194
Leprosy	7 (58.3)	3 (25)	2 (16.7)	12
Cutaneous TB	4 (33.3)	1 (8.3)	7 (58.4)	12

Continued

Abscess	1 (10)	2 (20)	7 (70)	10
Bacillary angiomatosis	1 (16.7)	5 (83.3)	0 (0.0)	6
DHD	0 (0.0)	1 (25)	3 (75)	4
Folliculitis	1 (100)	0 (0.0)	0 (0.0)	1
Furuncle	0 (0.0)	0 (0.0)	1 (100)	1
Necrotizing fasciitis	1 (100)	0 (0.0)	0 (0.0)	1
Fungal dermatoses				
Cryptococcosis	2 (33.3)	1 (16.7)	3 (50)	6
Non-specific mycosis	1 (16.7)	1 (16.7)	4 (66.6)	6
Histoplasmosis	2 (66.7)	0 (0.0)	1 (33.3)	3
Pityriasis versicolor	0 (0.0)	0 (0.0)	1 (100)	1
Candidiasis	0 (0.0)	0 (0.0)	1 (100)	1
Viral dermatoses				
Wart	12 (38.7)	7 (22.6)	12 (38.7)	31
Papilloma	1 (25)	0 (0.0)	3 (75)	4
Condyloma	0 (0.0)	0 (0.0)	1 (100)	1
Parasitic dermatoses				
Leishmaniasis	2 (25)	1 (12.5)	5 (62.5)	8
Filariasis	0 (0.0)	0 (0.0)	2 (100)	2
Onchocerciasis	0 (0.0)	0 (0.0)	1 (100)	1

Among inflammatory and autoimmune dermatoses, the total concordance rate for scleroderma and lichen showed the highest overall concordance rates (80% and 78.6%, respectively), while the lowest were Wells syndrome and cutaneous mastocytosis (0%) (Table 8).

Table 8. Evaluation of concordance rate for inflammatory and autoimmune dermatoses.

Inflammatory and autoimmune dermatoses	Total Concordance (%) (n = 102)	Partial concordance (%) (n = 89)	Non-concordant (%) (n = 103)	Total (n = 294)
Eczema	35 (33.6)	34 (32.7)	35 (33.6)	104
Lichen	24 (42.9)	20 (35.7)	12 (21.4)	56
Psoriasis	5 (22.7)	8 (36.4)	9 (40.9)	22
Autoimmune bullous dermatosis	7 (41.2)	6 (35.3)	4 (23.5)	17
Scleroderma	10 (66.7)	2 (13.3)	3 (20)	15
Lupus erythematosus	6 (50)	3 (25)	3 (25)	12
Eczematid	1 (9.1)	4 (36.4)	6 (54.5)	11
Granuloma	1 (9.1)	3 (27.3)	7 (63.6)	11
Vasculitis	1 (10)	0 (0.0)	9 (90)	10

Continued

Mastocytosis	0 (0.0)	0 (0.0)	6 (100)	6
Prurigo	3 (60)	1 (20)	1 (20)	5
Erythema nodosum	3 (60)	0 (0.0)	2 (40)	5
Erythroderma	0 (0.0)	1 (20)	4 (80)	5
Atopic dermatitis	2 (50)	2 (50)	0 (0.0)	4
Drug eruption	1 (25)	2 (50)	1 (25)	4
Urticaria	1 (100)	0 (0.0)	0 (0)	1
Pityriasis rosea	0 (0.0)	1 (100)	0 (0.0)	1
Non-specific dermatitis	0 (0.0)	1 (100)	0 (0.0)	1
Seborrheic dermatitis	1 (100)	0 (0.0)	0 (0.0)	1
Neutrophilic dermatosis	1 (100)	0 (0.0)	0 (0.0)	1
Wells syndrome	0 (0.0)	0 (0.0)	1 (100)	1
Vitiligo	0 (0.0)	1 (100)	0 (0)	1

For benign cutaneous tumors, a high total concordance rate was noted for lipomas (73.2%). The lowest rates (0%) concerned nodular hidradenoma, fibrous dysplasia, elephantiasis, mucocele, neuroma, adenofibroma, cholesteatoma, and syringoma (Table 9).

Table 9. Concordance of benign tumoral dermatoses.

Benign tumoral dermatoses	Total concordance (%) (n = 164)	Partial concordance (%) (n = 18)	Non-concordant (%) (n = 81)	Total (n = 350)
Lipoma	79 (73.2)	21 (19.4)	8 (7.4)	108
Cyst	62 (59.6)	9 (8.7)	33 (31.7)	104
Neurofibroma	9 (33.3)	8 (29.6)	10 (37.1)	27
Fibroma	1 (4.8)	8 (38.1)	12 (57.1)	21
Botryomycome	4 (33.3)	6 (0.0)	8 (66.7)	18
Polyp	4 (25)	0 (0.0)	12 (75)	16
Hamartoma	6 (42.9)	3 (21.4)	5 (35.7)	14
Keloid	7 (58.3)	0 (0.0)	5 (41.7)	12
Angioma	3 (27.3)	5 (45.4)	3 (27.3)	11
Molluscum	3 (37.5)	0 (0.0)	5 (62.5)	8
Histiocytofibroma	2 (40)	0 (0.0)	3 (60)	5
Dermatofibroma	0 (0.0)	3 (60)	2 (40)	5
Endometriosis	1 (50)	0 (0.0)	1 (50)	2
Ameloblastoma	1 (50)	1 (50)	0 (0.0)	2
Nodular hidradenoma	0 (0.0)	0 (0.0)	1 (100)	1
Fibrous dysplasia	0 (0.0)	0 (0.0)	1 (100)	1

Continued

Elephantiasis	0 (0.0)	0 (0.0)	1 (100)	1
Mucocele	0 (0.0)	0 (0.0)	1 (100)	1
Neuroma	0 (0.0)	0 (0.0)	1 (100)	1
Adenofibroma	0 (0.0)	0 (0.0)	1 (100)	1
Cholesteatoma	0 (0.0)	0 (0.0)	1 (100)	1
Neuroma	0 (0.0)	0 (0.0)	1 (100)	1
Syringoma	0 (0.0)	0 (0.0)	1 (100)	1

Among cutaneous cancers and borderline tumors, the overall concordance rate was highest for Kaposi's disease (83.5%). The concordance rate for cancers and borderline tumors is presented in the following table (Table 10):

Table 10. Concordance of malignant and borderline tumoral dermatoses.

Malignant and borderline tumoral dermatoses	Total concordance (%) (n = 113)	Partial concordance (%) (n = 38)	Non-concordant (%) (n = 62)	Total (n = 213)
Kaposi's disease	72 (62.6)	24 (20.9)	19 (16.5)	115
Squamous cell carcinoma	14 (73.7)	1 (5.3)	4 (21)	19
Melanoma	8 (26.7)	4 (13.3)	18 (60)	30
BCC	5 (50)	1 (10)	4 (40)	10
Non-specific sarcoma	1 (33.3)	0 (0.0)	2 (66.7)	3
Fibromyxoid sarcoma	0 (0.0)	1 (50)	1 (50)	2
Fibrosarcoma	2 (28.6)	3 (42.8)	2 (28.6)	7
Pleomorphic sarcoma	0 (0.0)	1 (100)	0 (0.0)	1
Lymphoma	3 (14.3)	10 (47.6)	8 (38.1)	21
Non-specific carcinoma	2 (22.2)	3 (33.3)	4 (44.4)	9
Adenocarcinoma	1 (50)	1 (50)	0 (0.0)	2
Liposarcoma	1 (25)	0 (0.0)	3 (75)	4
Dermatofibrosarcoma	4 (36.4)	6 (54.5)	1 (9.1)	11
Angiocarcinoma	1 (20)	1 (20)	3 (60)	5

Regarding other cutaneous conditions, the rate of non-concordance and overall concordance was similar for keratoderma. In diseases of hair follicles and skin appendages, anatomoclinical non-concordance was noted regarding acne and pilomatricomatosis. Among genodermatoses, nevus was the predominant pathology with a total anatomoclinical concordance rate of 65.4%, and vascular dermatoses had a high total concordance rate for ulcers (95.8%).

The evaluated kappa coefficient was 0.309, corresponding to moderate agreement between the different clinical diagnoses suggested by the prescriber and the anatomopathologist. We considered that for a p-*value* <0.001, the data were statistically significant. The evaluation of the concordance rate between different

types of dermatoses suggested by the clinician and the anatomopathologist is represented in Table 11.

Table 11. Concordance between different types of dermatoses.

Pathologist/Clinician	Infectious dermatoses	Inflammatory and AI dermatoses	Storage dermatoses	Benign tumoral dermatoses	Malignant tumoral dermatoses	Vascular dermatoses	Genodermatoses	Hair follicle and appendage diseases	Other cutaneous conditions	Kappa coefficient	p-*value*
Infectious dermatoses	144 (52.9)	30 (7.1)	0(0.0)	15 (2.8)	21 (4.5)	92 (46.5)	6 (9.0)	0(0.0)	5 (9.3)	0.309	<0.001
Inflammatory and AI dermatoses	9 (3.3)	182 (42.9)	0(0.0)	7 (1.3)	3(0.6)	3 (1.5)	5 (7.5)	0(0.0)	7 (13)		
Storage dermatoses	1 (0.4)	2 (0.5)	1 (100)	2 (0.4)	1 (0.2)	0(0.0)	0(0.0)	0(0.0)	0(0.0)		
Benign tumoral dermatoses	17 (6.3)	12 (2.8)	0(0.0)	242 (44.4)	40 (8.5)	4 (2.0)	4 (6.0)	1 (16.7)	4 (7.4)		
Malignant tumoral dermatoses	12 (4.4)	24 (5.7)	0(0.0)	30(5.5)	145 (30.9)	13(6.6)	8(11.9)	0(0.0)	1(1.9)		
Hair follicle and appendage diseases	1(0.4)	1 (0.2)	0(0.0)	2 (0.4)	0 (0.0)	0(0.0)	0(0.0)	1 (16.7)	0(0.0)		
Genodermatoses	0(0.0)	5 (1.2)	0(0.0)	4(0.7)	0(0.0)	0(0.0)	17 (25.4)	0(0.0)	2(3.7)		
Vascular dermatoses	13(4.8)	4 (0.9)	0(0.0)	1(0.2)	15 (3.2)	55 (27.8)	0(0.0)	0(0.0)	0(0.0)		
Other cutaneous conditions	1(0.4)	6 (1.4)	0(0.0)	2 (0.4)	2 (0.4)	2(1.0)	1 (1.5)	0(0.0)	7(13)		

Among the 1,325 clinical diagnoses mentioned, we noted an overall concordance rate of 67.9% and a non-concordance rate of 32.1%, with a higher overall concordance rate for benign tumoral dermatoses (70.8%), followed by malignant tumors (70.1%). There was almost no difference in the overall concordance rate by sex, being 67.8% for males and 67.6% for females. We also noted a high non-concordance rate in infectious dermatoses (34.7%) at the same time as a strong partial concordance rate (36.3%). Table 12 below is a summary table of the concordance rate according to the different types of dermatoses:

Table 12. Evaluation of concordance for dermatosis types.

Types of dermatoses	Total concordance (%) (n = 558)	Partial concordance (%) (n = 280)	Non-concordant (%) (n = 397)	Total (n = 1325)
Benign tumoral dermatoses	181 (51.7)	67 (19.1)	111 (31.7)	350
Infectious dermatoses	90 (29)	113 (36.3)	108 (34.7)	305
Inflammatory and autoimmune dermatoses	102 (34.7)	89 (30.3)	109 (37.0)	294

Continued

Malignant tumoral dermatoses	112 (50)	45 (20.1)	67 (29.9)	224
Vascular dermatoses	50 (53.2)	17 (18.1)	27 (28.7)	94
Genodermatoses	17 (58.6)	2 (6.9)	10 (34.5)	29
Storage dermatoses	0 (0.0)	2 (28.6)	5 (71.4)	7
Hair follicle and skin appendage diseases	0 (0.0)	0 (0.0)	4 (100)	4
Other cutaneous conditions	5 (31.3)	4 (25)	7 (43.7)	18

4. Discussion

The presented work was a descriptive study with retrospective data collection aimed at determining the histoclinical concordance rate in dermatopathology at the CPC.

In our study, the mean age was 40.9 ± 19.4 years, with extremes of 0 and 95 years. Patients in the 30 to 45 years age group were most affected. These data are in agreement with those mentioned by Darré *et al.* in Togo, where the mean age was 35.4 years, with extreme ages of 3 and 99 years [6].

The M/F sex ratio was equal to 1.04, so there was no real difference between sexes in our distribution. This is in agreement with the data mentioned by Malik *et al.* in India, who found an M/F sex ratio of 1.1 [7].

Regarding the prescribers in our study, dermatologists (32%) were most frequently found. This could be due to the fact that the CPC is located in an urban area where dermatologists can be easily found.

Among the clinical elementary lesions, ulceration (28%) was most frequently found, which could be explained by the fact that ulceration was one of the clinical manifestations most frequently found in tumoral dermatoses [8].

The most commonly used sampling method was punch biopsy (46.9%), a technique preferentially used by dermatologists, who were also the most frequent prescribers in our study [5]. This percentage is significantly lower than that of Al-Saif *et al.* (82.1%), which could be explained by the fact that tumoral dermatoses were most frequently found in our distribution, and in this case, the preferential techniques were mass excisions (26.1%) and scalpel biopsy (26.5%) [3].

The most represented sampling site was the lower extremities (37.6%), which is in agreement with the results of Korfitis *et al.* which was 38.3% [9]. This similarity in results may be due to the fact that the most commonly encountered pathologies are tumoral dermatoses (49.9%), whose preferential locations are the extremities, more specifically the lower extremities [10].

The clinical diagnoses most commonly suggested by the clinician were tumoral dermatoses (43.3%), similar to what Korfitis *et al.* found, being 41.7% [9]. However, the clinical diagnoses most commonly suggested by Malik *et al.* in India were infectious dermatoses (37.6%), followed by inflammatory (32%) [7]. This diver-

gence in results could be due to several factors (prescriber, the veracity of diagnoses suggested in relation to lesions).

The most frequently found histological diagnoses were tumoral dermatoses (49.9%), then inflammatory (20.8%), similar to those mentioned by Darré *et al.* in Togo. However, the most frequently found histological diagnoses by Malik *et al.* were infectious dermatoses (37.6%), followed by inflammatory (32%) [7]. This disagreement could be related to the appearance of tumoral lesions in a context of depigmentation, which is booming among Cameroonian women (43.6%) [11], and also to the fact that not all clinically infected lesions are sampled.

In our distribution, concordance was evaluated on only 65% of samples, which can cause bias in concordance evaluation. We observed a fairly high total concordance rate of 45.2%, followed by a non-concordance rate of 32.1%, and a partial concordance rate of 22.7%. The overall histoclinical concordance rate in our study group was 67.9%. This value is close to the study by Malik *et al.* in India, where 2216 cases of cutaneous specimens were performed with an overall concordance rate of 61.1% [7]. However, this rate is lower than that found by Al-Saif *et al.* in Saudi Arabia, where 4268 cutaneous specimens were performed over 15 years with an overall concordance rate of 75.9% [3] [7]. This value could be explained by the fact that the period and sample size of this study were larger than ours.

In our study, we observed a high total concordance rate for benign tumoral dermatoses (51.7%), similar to the data of Al-Saif *et al.*, being 55.3% for benign tumors. These data were in disagreement with the results of Sa and Kumar in Pakistan, where there was a predominance of total concordance rate for inflammatory dermatoses (63.4%) [5]. This divergence in results could be explained by the fact that in our distribution, the most frequently found tumoral dermatosis was lipoma, which has a very suggestive clinical appearance.

We observed a high non-concordance rate for hair follicle and skin diseases (100%) and storage dermatoses (71.4%), and a low rate for vascular dermatoses (28.7%), contrary to Al-Saif *and al.*, where the non-concordance rate was high for environmental diseases (43%) and pigmentary diseases (41.4%) and low for tumoral dermatoses (12.3%) [3]. This could be explained by the fact that hair follicle and skin diseases and storage dermatoses were rare pathologies that were not sufficiently suggested by the clinician in our setting.

The partial concordance rate was higher for infectious dermatoses (36.3%). However, for the study by Sa and Kumar, connective tissue disorders (25.9%) and inflammatory dermatoses (25%) had a higher partial concordance rate [5]. This could be due to the fact that infectious dermatoses, regardless of etiology, have clinical similarities with tumors.

Inflammatory and autoimmune dermatoses had an overall concordance rate for scleroderma (80%), and lichen (78.6%). These data are in agreement with those of Malik *et al.*, where a higher overall concordance rate was noted for lichen (56.33%), and certain spongiform dermatitis (73.5%) [7].

Infectious dermatoses had a higher overall concordance rate for bacillary angiomatosis (100%), leprosy (83.3%), and Buruli ulcers (72.7%). The study by Malik *et al.* found a predominance of overall concordance rate for cutaneous tuberculosis (70.8%), followed by leprosy (51.3%) [7]. This divergence in results could be due to the fact that the implementation of SOPs (Standard Operational Procedures) by the Ministry of Public Health in Cameroon would have allowed better diagnosis of Buruli ulcers and leprosy [4]. However, the high overall concordance rate for bacillary angiomatosis could be due to suggestive lesions that are almost similar to those of Kaposi's disease.

Benign tumoral dermatoses had a high overall concordance rate for lipoma (92.6%) and cysts (68.3%). In India, among benign tumoral dermatoses, a predominance of the overall concordance rate was noted for cysts (68.5%) [7].

Regarding cutaneous cancers and borderline tumors, a higher overall concordance rate was found in Cameroon for Kaposi disease (84.9%). However, in India, according to Malik *et al.*, BCC was the cutaneous cancer with the highest overall concordance rate, at 79.16%. This could be explained by the fact that the incidence of BCC in fair and white skin is higher, contrary to sub-Saharan Africa, where Kaposi disease, often linked to HIV, and squamous cell carcinomas are most frequently found [8]. In our context, the incidence of HIV is evolving, hence the predominance of Kaposi's disease [12].

Storage dermatoses (28.6%) and hair follicle and skin appendage diseases (0%) were, in our study, the pathologies that had a low overall concordance rate. In Saudi Arabia, in the study by Al-Saif *et al.*, vascular dermatoses (57.3%) and pigmentary diseases (27.6%) were found to have a low overall concordance rate [3]. This could be explained by the fact that these pathologies were least suggested by the clinician and the dermatopathologist.

5. Conclusion and Recommendations

At the end of our study, which aimed to determine the concordance rate between clinical and histopathological diagnoses at the CPC, it emerged that there was good histoclinical concordance in dermatopathology, with an overall concordance rate of 67.9%.

These results show that efforts must be made at several levels to improve the management of skin diseases in our setting. In order to increase the concordance rate between clinical and histopathological diagnoses in our country, we humbly make the following recommendations:

To the Ministry of Public Health

Promote continuing education for healthcare personnel.

To clinicians

Comply with standards for skin sampling, specimen storage, and the completion of clinical information forms.

To pathologists

Develop and display Standard Operating Procedures (SOPs) in the ACP labor-

atory in front of the workbench.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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