

# Cutaneous tuberculosis: A series of 10 cases collected at the Dermatology-Venereology Department of the Treichville University Hospital Center

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## ABSTRACT

**Background:** Cutaneous tuberculosis is a rare and under-diagnosed localization of tuberculosis due to its anatomical-polymorphism and the infrequent isolation of mycobacteria. The general objective of our study was to identify its epidemiological, clinical, paraclinical, and evolutive particularities in our working environment. **Methods:** We conducted a prospective study of case series from January 2019 to July 2022. Any patient presenting suggestive clinical signs of cutaneous tuberculosis, as well as a histological and/or biological confirmation, was included. **Results:** Out of 26024 patients consulted, 10 cases of cutaneous tuberculosis were identified (0.03%), with a male predominance (M/F ratio of 9). The average age of the patients was 24 years, with an interquartile range of 23 years and extremes of 5 and 57 years. The main clinical forms identified were scrofulodermas (7 cases). We noted three exceptional cases in which several clinical forms were associated: gummas and verrucous tuberculosis, scrofulodermas and gummas, and scrofulodermas, gummas, and verrucous tuberculosis. Histopathology of skin fragments showed tuberculoid granuloma associated with caseous necrosis in 100% of the cases. Auramine staining found AFB in 67% while PCR revealed *Mycobacterium tuberculosis* in 85.71%. HIV serology was negative in all patients. **Conclusion:** Cutaneous tuberculosis in Abidjan is dominated by multibacillary forms, namely gums and scrofuloderma such as other series in the West African subregion. The negativity of HIV serology in all our patients raises the question of the link between cutaneous tuberculosis and HIV as well as the favoring factors of cutaneous tuberculosis in our context.

**Key words:** Abidjan, Ivory coast, Epidemiology, Cutaneous tuberculosis

## INTRODUCTION

Tuberculosis is an infectious, chronic, and contagious disease of primarily human-to-human transmission caused by *Mycobacterium tuberculosis* or Koch's bacillus (BK) [1]. It is the second most common infectious disease in the world after HIV infection and the leading cause of death. In 2019, its global incidence was estimated at 10 million people and the number of related deaths was 1.2 million [2]. In Ivory Coast, 36,000 cases of cutaneous tuberculosis (cTB) were reported in 2014,

and in a meta-analysis of hospital-based studies, the proportion of extra-pulmonary tuberculosis (EPT) ranged from 16% to 50% with lymph node and pleural forms predominating [3]. However, the cutaneous location of the disease remains rare and difficult to diagnose due to its anatomical-clinical polymorphism, which is the source of a multitude of differential diagnoses and patient wandering [4-7]. Based on this observation, we conducted this study with the aim of studying the epidemiological, clinical, paraclinical, and evolutionary particularities of cutaneous tuberculosis in Abidjan.

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## METHODOLOGY

This was a prospective case series study of all cases of cTB diagnosed in patients who consulted the Dermatology-Venerology Department of the University Hospital Center of Treichville between January 2019 and July 2022. Our study included patients presenting clinical signs suggestive of cTB associated with a paraclinical confirmation performed on a skin sample. The elements that allowed for this paraclinical confirmation were the presence of *Mycobacterium tuberculosis* on GEN XPERT® MTB/RIF skin samples (ulceration or pus) and/or the visualization of acid-fast bacilli (AFB) after staining with Auramine and/or the presence of a tuberculoid gigantocellular granuloma on histopathological examination. For each patient, epidemiological (age, sex), clinical (time to disease progression, clinical form), paraclinical (results of tuberculin tests, bacteriological skin samples, skin histology, chest X-ray, abdominal ultrasound), therapeutic (treatment protocol), and evolutionary (cure, failure and loss of sight) variables were specified. Depending on the context, other assessments (bacteriological samples outside the skin and other radiological examinations) were also performed.

## RESULTS

### Prevalence and Socio-Demographic Characteristics

During the study period, 26.024 patients were consulted and 10 cases of cTB diagnosed, representing a prevalence of 0.03% and a hospital incidence of 2.93 cases per year. The median age was 24 years, with an interquartile range of 23 years and extremes of 5 to 57 years. The 20–30-year age group accounted for 40% of the patients, while the 5–10-year age group accounted for 30%. Forty percent of our patients had a secondary education; all resided in the city of Abidjan or its suburbs with 30% and 20%, respectively, in the communes of Yopougon and Abobo.

### Clinical Features

The duration of the disease before the first consultation varied between five months and ten years, with a median of one year. Eight patients had been vaccinated with BCG and only one had previous contact with tuberculosis.

The main dermatological lesions were firm nodules present in 70% of the patients, or fistulized (40%),

ulcerations (70%), retractile scars (40%), fluctuating tumors (30%), and verrucous plaques (20%) (Table 1). Ten cases of scrofuloderms or écouelles were observed (70%), and we noted three cases of the association of several clinical forms. Associated visceral localizations were found in all ten patients: lymph node localization in eight cases and pulmonary in two.

### Paraclinical Characteristics

The tuberculin or PPD standard test performed in six patients (Table 2) was positive in all (100%). Histological examination in seven patients (Table 2) showed tuberculoid granuloma with caseous necrosis in all (100%). A search for AFB by auramine staining in three patients was positive in two (66.7%) and the detection of *Mycobacterium tuberculosis* by gene amplification in purulent secretions was positive in six out of seven cases (85.7%), all of which were sensitive to rifampicin (Table 3). All our patients had negative HIV serology.

### Treatment and Progress

The treatment regimen according to the National Tuberculosis Control Programme in Ivory Coast was

**Table 1:** Clinical forms and paraclinical examinations.

Clinical Form	SFD	SFD + Gummas	Gummas + VT	SFD + Gummas+VT	Total
Number of patients	7	1	1	1	10

SFD: scrofuloderma, VT: verrucous tuberculosis

**Table 2:** Results of PPD and skin histology.

Clinical Form	Number	PPD		Histology	
		made	positive	made	conclusive aspect
SFD	7 cases	4	4	5	5
SFD + Gummas	1 case	0	0	0	0
Gummas + VT	1 case	1	1	1	1
SFD + Gummas + VT	1 case	1	1	1	1
Total	10 cases	6	6	7	7

SFD: scrofuloderma, VT: verrucous tuberculosis

**Table 3:** Auramine staining microscopy and PCR results.

Clinical Form	Number	Auramine staining		PCR	
		made	positive	made	Positive
SFD	7 cases	2	1	5	4
SFD + Gummas	1 case	0	0	1	1
Gummas + VT	1 case	0	0	0	0
SFD + Gummas + VT	1 case	1	1	1	1
Total	10 cases	3	2	7	6

PCR: polymerase chain reaction, SFD: scrofuloderma, VT: verrucous tuberculosis

2RHZE/4RH in seven patients and 2RHZ/4RH in the three others, depending on their weight. However, in one patient suffering from scrofuloderma, due to the persistence of nodular lesions that remained fistulized despite an improvement in general condition, the protocol was extended to seven months for the maintenance phase to obtain healing.

Healing was achieved in nine of the patients at the cost of numerous retractile scars, and one patient was lost to follow-up.

## DISCUSSION

cTB is a rare extrapulmonary localization of BK, even in highly endemic countries such as Ivory Coast [4-9]. In our series, the annual hospital incidence of cTB was 2.93 cases. This was consistent with a series from the Maghreb [10,11], yet it was lower in counterparts in the West African subregion: 3.38 cases/year in Mali [7] and 4.57 cases/year in Senegal [6]. This could be explained by the fact that our study coincided with the onset and peak of the COVID-19 pandemic, which was marked by a decline in hospital attendance. The relatively young age of onset in our study is typical of cTB in sub-Saharan regions [6,7]. We note the ubiquitous nature of the disease marked by a distribution that does not distinguish between the age of the patients, their level of education, or their area of residence.

Clinically, the richness of symptoms observed in our study testifies to the anatomical-clinical polymorphism of TB and constitutes a diagnostic

difficulty for practitioners. Only lesions of true cutaneous tuberculosis were collected in our series, as in other studies conducted in West Africa [6-8] with a scrofuloderma and gumma predominance. This predominance was observed in all regions of the world (Europe [12], South America [13], Maghreb [9,11,14], and sub-Saharan Africa [6,7]) with the exception of Asia, where there was a clear predominance of lupus tuberculosis [15,16].

No patient was HIV positive in our series. The same observation was also made in France and Morocco [9,12]. However, Ossalé Abacka et al., in a retrospective study comparing EPT and pulmonary tuberculosis (PT), found an HIV positivity rate of

Patient 1 (iconographies of University Teaching Hospital of Treichville)



**Figure 2:** Verrucous lesions on the right forearm.

Patient 1 (iconographies of University Teaching Hospital of Treichville)



**Figure 1:** (a and b) Painless and renitent subcutaneous nodules on the face and scalp (tubercular gummas).

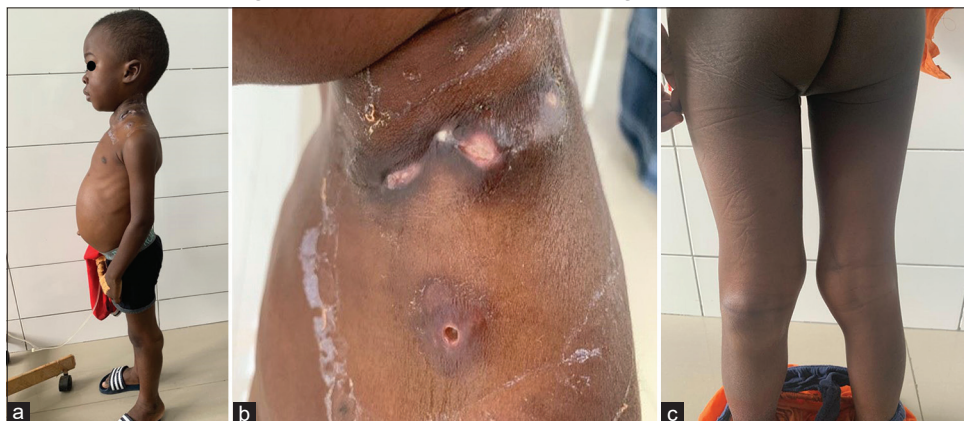
Patient 2 (iconographies of University Teaching Hospital of Treichville)



**Figure 3:** (a and b) Fluctuating, painless tumor in the right cervical region (tubercular gumma) and scrofuloderma of the right eyelid.

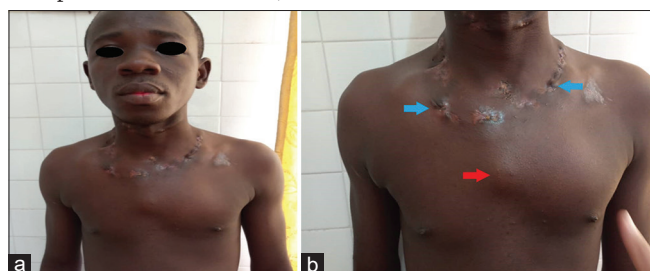


Patient 2 (iconographies of University Teaching Hospital of Treichville)



**Figure 4:** (a-c) Fluctuating tumor of the left popliteal fold (tubercular gumma) and scrofuloderma of the left supra-clavicular region.

Patient 3 (iconographies of University Teaching Hospital of Treichville)



**Figure 5:** (a b) Scrofuloderma and gumma. → (blue arrow) Scrofulodermas in the cervical region in a collar arrangement. → (red arrow) Gumma in the sternal region.

37.34% for EPT and concluded that the latter was the prerogative of subjects with weak immune defense [17]. However, the latter did not record any cases of cTB. This concrete difference between the cTB and the other EPT on HIV co-infection raises the question of whether HIV, or even immunodepression in general, has a real, direct or indirect link in the development of cutaneous tuberculosis.

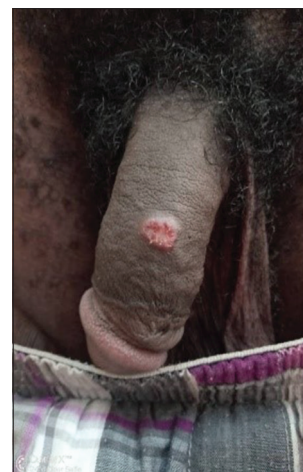
The PPD performed on six patients had a 100% positivity rate. These patients all had scrofuloderma and/or gumma, two clinical forms known as multibacillary. Knowing that the pauci/multibacillary classification in cTB is based on the same principle as that of Ridley and Jopling in leprosy, one would expect a negative PPD, which is not the case and once again calls into question the impact of immunodepression in this disease. PCR had a positivity rate of 85.7% with a sensitivity to rifampicin in all cases and the efficacy of the first-line antituberculosis treatment was noted. This efficacy was found in almost all

Patient 3 (iconographies of University Teaching Hospital of Treichville)



**Figure 6:** Pus puncture of the gumma at the sternum.

Patient 3 (iconographies of University Teaching Hospital of Treichville)



**Figure 7:** Verrucous lesion.

studies, although there were variations in the duration of treatment [6,7,9,10,14].

The particularity of our study was that 3 out of our 10 patients had several clinical forms of cTB simultaneously, namely, gummas and verrucous tuberculosis (patient 1, Figs. 1 – 2), scrofuloderma and gummas (patient 2, Figs. 3 – 4), and especially scrofuloderma, gummas and verrucous tuberculosis (patient 3, Figs. 5 – 6). Combinations of two clinical forms have been frequently observed in the last decade [9,11,18,19], yet a combination of three clinical forms remained rare, even exceptional. As with other authors, we were unable to establish a link between all these patients that could explain this phenomenon, and no immunodepression factor was found. However, the frequent coexistence of several clinical forms of cTB in the same patient would indicate a preferential attack of cTB in specific areas that remain to be identified.

## CONCLUSION

Our series illustrates the anatomical-clinical polymorphism of cTB marked by the predominance of the so-called multibacillary forms with scrofuloderms and gummies. The first-line anti-tuberculosis treatment remains effective. We did not find any association with immunodepression in general, or HIV in particular, and it would be advisable in our context to look for favoring factors of the occurrence of cTB.

## Statement of Human and Animal Rights

All the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the 2008 revision of the Declaration of Helsinki of 1975.

## Statement of Informed Consent

Informed consent for participation in this study was obtained from all patients.

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