*Case report*

# Cutaneous tuberculosis in a hemodialysis patient in a tertiary hospital in Burkina Faso


## Abstract

Pulmonary lesions remain a significant public health problem. Extrapulmonary lesions can occur. Cutaneous localization is uncommon and favored by immunosuppression, such as chronic hemodialysis. Chronic non-healing wounds of immunocompromised patients are very often neglected. In developing countries, diagnosis is usually complicated and delayed due to scarcity of resources. New diagnostic tests are inaccessible in Burkina Faso, which contrasts with the availability of treatment. We report a case of cutaneous tuberculosis in a patient undergoing chronic hemodialysis, diagnosed based on a chronic wound with a positive Tuberculosis Skin Test and histological evidence. The wound completely healed after six months of anti-tuberculosis treatment.



**Keywords**: Tuberculosis, cutaneous, chronic hemodialysis, Burkina Faso

**Case presentation**

Tuberculosis is a public health problem, with pulmonary localization accounting for over 80% of cases [1]. Cutaneous tuberculosis comprises about 1% to 1.5% of all extrapulmonary manifestations [2]. Lesions mimic other common conditions that can lead to misdiagnoses. Infection with the human immunodeficiency virus, diabetes, and end-stage kidney disease are considered to be the main contributing factors. The pathology is rare, diagnosis is often complicated, and microbiological confirmation is not always possible [3]. With this in mind, we report a cutaneous tuberculosis case in a chronic hemodialysis patient in the Nephrology Department of the Yalgado Ouédraogo University Hospital.

Mr. G A K is a male patient, aged 21, a butcher by profession, resident in a peripheral district of Ouagadougou, hypertensive, treated with perindopril eight milligrams and amlodipine ten milligrams a day, with no other drug treatment. He underwent chronic hemodialysis for six months (two sessions per week) via a femoral central venous catheter for chronic kidney stage 5 due to unknown nephropathy.

Physical examination revealed an initially nodular ulcerated lesion that had been evolving for over six months prior to the start of hemodialysis in an apyretic context with no pruritus, cough, or signs of tuberculosis impregnation. The lesion was located in the proximal third of the anterior aspect of the left arm. It was ulcerating- budding, roughly rounded, measuring four centimeters long, well limited to the crusty edges, raised with a soft base, budding and painless (Figure 1). The patient had no generalized or locoregional adenopathy. The physical examination was normal.

A tuberculin skin test and histopathology were performed to make the diagnosis. Sputum examination by GeneXpert was negative. However, there was a highly reactive tuberculin skin test measuring 25 millimeters. Human immunodeficiency virus retroviral serology was negative, and Chest X-ray was also standard. Pathological findings of the cutaneous lesion revealed inflammatory granulomatous, epithelioid, and gigantocellular lesions. Epithelioid cells, lymphocytes, numerous multinucleated giant cells of the Langhans and Müller type, and numerous altered polynuclears were noted. Small foci of anhistic, eosinophilic caseous necrosis were also associated with fibrosis (Figure 2). Within the limits of the specimen, there was no tumor proliferation. The histological appearance was suggestive of cutaneous mycobacteriosis. Neither culture nor polymerase chain reaction (PCR) testing could be performed. Mycobacterium

tuberculosis was incriminated as a priority. The precise variant of the mycobacteria could not be determined due to the lack of culture.

After a pre-therapeutic workup, anti-tuberculosis treatment was started, adapted to the patient's renal function according to the Information Conseil Adaptation Renal (ICAR) letter, with three rifampicin/ isoniazid tablets daily and four pyrazinamide/ethambutol tablets every forty-eight hours [4]. The lesion healed one month after the start of anti-tuberculosis treatment. Treatment, well-tolerated, was successful with anti-tuberculosis medication during six months of complete treatment.

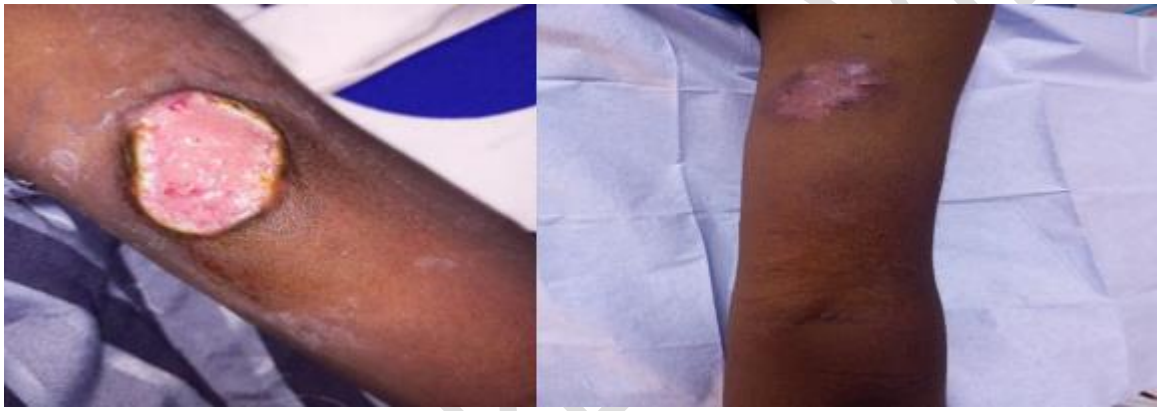

Figure 1: Ulcerated lesion on the anterior aspect of the left thoracic limb at diagnosis and after two months of anti-tuberculosis treatment (Images taken by Alassane Dianda)

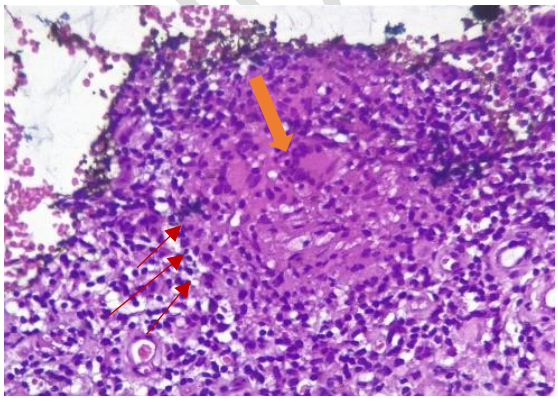

Figure 2: Histological lesion; hemateins-eosin staining at intermediate magnification; Langhans-type giant cells (orange arrow); lymphocytic infiltration in red arrows (Image taken by Aida Sandrine Ouédraogo).

**Discussion**

Cutaneous tuberculosis is a rare extra-pulmonary localization [1,2]. The rarity of this condition highlights the importance of investigating all chronic wounds in hemodialysis patients. The lingering nature of the condition, combined with the absence of life-threatening organ involvement in our patients, may explain the long evolution of lesions before positive diagnosis [6]. Chronic Kidney Disease stage 5 is an immunocompromised state since uremia causes inflammation, reduces immune system function, and increases susceptibility to infection [5]. Risk factors for the development of this condition included end-stage kidney disease, living in an endemic area, and occupation as a butcher. In addition, the disease can take a variety of clinical forms.

Lesions may be discrete erythematous papules, an infiltrated plaque, or a nodule evolving into an ulcerated lesion, pustules, or vesicles [7,8]. In the context of limited human and material resources, diagnosing extrapulmonary tuberculosis is often tedious. Means of diagnosis confirmation are not always accessible, leading to delays in managing this pathology. The current reference methods for diagnosis are microscopy and culture. However, the low sensitivity of microscopy and the laborious, time-consuming procedures involved in culture means these methods are less effective than the others [9]. The laboratory confirms the etiological agent by direct screening and culture, histopathological analysis, interferon-gamma release assay (IGRA), and polymerase chain reaction (PCR). Hemodialysis patients are a target group for the IGRA test, which is expensive in low-income countries like Burkina Faso.

Interferon-gamma release testing in this high-risk group has the advantage of not being subject to cross-reactivity with individuals vaccinated with Bacille Calmette et Guérin. Immunological tests, QuantiFERON TB gold and EliSpot, can predict tuberculosis [4]. Moreover, this immunocompromised population should not overlook atypical mycobacteriosis [11], hence the importance of histopathology and culture.

The skin test is a relatively inexpensive examination, but its interpretation is limited since a positive result does not necessarily indicate active tuberculosis[12]. Mycobacterium tuberculosis var tuberculosis was strongly suspected, although the bovid variant could also be implicated, given the patient's occupation. Genotyping, the recent advance in the diagnosis of cutaneous tuberculosis, tends to separate atypical mycobacteria from *Mycobacterium tuberculosis* [4]. One limitation was the lack of precise identification of the germ variant.

The diversification of diagnostic methods in a developing country can be a lifesaver. In addition, the treatment regimen is based on antibacillary drugs, in line with Burkina Faso's national tuberculosis control program [13], with dosage adapted to the patient's renal function following the ICAR letter [4]. The antibiotics used are accessible and free of charge, making disease management relatively straightforward. The medicines used are recommended by the World Health Organization and the Centers for Disease Control and Prevention [14-16]

## Conclusion

Cutaneous tuberculosis remains a rare and probably underdiagnosed pathology in developing countries. Although it is rare in the general population, it should always be considered in the presence of a chronic wound, especially in immunocompromised patients.

## Consent

We have obtained the patient's verbal and written consent for the use of the data collected.

**Competing interests: None**

**Disclaimer (Artificial intelligence)**

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Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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