Scholars Journal of Applied Medical Sciences
Abbreviated Key Title: Sch J App Med Sci
ISSN 2347-954X (Print) | ISSN 2320-6691 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Diabetology and Metabolic Diseases

Multifocal Tuberculosis in a Diabetic: An Atypical Manifestation

Mballou Camara[1*], Sana Rafi[1], Ghizlane El Mghari[1], Nawal El Ansari[1]

[1]Endocrinology, Diabetology and Metabolic Diseases Department, PCIM Laboratory, FMPM, Cadi Ayyad University, CHU Mohamed VI Marrakech, Morocco

DOI: 10.36347/sjams.2023.v11i02.035 | **Received:** 13.01.2023 | **Accepted:** 21.02.2023 | **Published:** 28.02.2023

***Corresponding author:** Mballou Camara
Endocrinology, Diabetology and Metabolic Diseases Department, PCIM Laboratory, FMPM, Cadi Ayyad University, CHU Mohamed VI Marrakech, Morocco

Abstract **Case Report**

Introduction: Multi-focal tuberculosis is an attack of two extra-pulmonary sites with or without pulmonary involvement. It is a rare pathology that is characterized by its large clinical and radiological polymorphism. We report the case of a 27-year-old patient with type 1 diabetes, who had had a stroke for 1 year. She reported the appearance of a sushyphoidal collection for a month. The clinical examination noted a sus-xyphoid collection firm edge and renit in its center of 5cm in diameterpainless evoking a cold abscess. Examinations had shown poorly systematized opacity at the level of the right lung base on chest radiography, with the ultrasound of the upper xyphoidal region showing abscess collected supersternal with discontinuous sternal cortices, suggesting bone lysis. The CT scan confirmed the appearance of sternal osteitis with collections of the softtissues opposite, multiple associated hepatic collections were objectified at the level of the abdominal sections with pulmonary involvement of infectious origin objectified to the thoracicsections. the puncture of the abscess had not found AFB. The diagnosis of multifocal tuberculosis was retained following a positive expert Gen test. Management consisted of anti- bacillary therapy, adjustment of insulin doses. The appearance of multi-focal tuberculosis is often misleading and can mislead the diagnosis. However, the essential thing is to know how to evoke them in order to be able to target the specific examinations and to engage the therapeutic strategy without delay. Our case illustrates an atypical manifestation of multifocal tuberculosis in a diabetic patient with pulmonary, cutaneous, hepatic and bone lesions of tuberculosis origin.

Keywords: Diabetes, multi-focal tuberculosis, Cold abscess.

INTRODUCTION

Due to its high incidence, tuberculosis (TB) is a major public health problem in developing countries. It mainly affects the lungs. Multifocal or disseminated attacks are rare, they represent 9 to 10% of extra-pulmonary locations [1, 2], they occur most often in immunocompromised patients, but they can affect immunocompetents. Multifocal tuberculosis is defined as the involvement of at least 2 extra-pulmonary sites, whether or not associated with pulonary involvement [3]. Despite global efforts to control tuberculosis, it remains common and its severe forms still prevalent. This is in part due to the growing development of a bed of contributing factors, primarily a field of immunosuppression. The association of diabetes with tuberculosis is well established; thus the diabetic field predisposes to severe and atypical forms of it [4]. Diabetes can disrupt the body's defense mechanisms and thus create a breeding ground for the development of tuberculosis [5]. We report a particular clinical observation of multifocal tuberculosis in a patient with type 1 diabetes.

CASE REPORT

This is a 27-year-old patient with type 1 diabetes for 12 years treated with a regimen of two premixed insulins combined with a rapid at noon. The patient was hospitalized with unstable diabetes. In his antecedents an ischemic stroke having occurred 1 year ago with right hemiplegia, facial paralysis and aphasia under carbamazepine, aspirin and simvastatin. She has been monitored for depression for 1 year on escitalopram. In addition, she reported 4 miscarriages without disturbance of the menstrual cycle. The history of his diabetes had found frequent hypoglycaemia of 3.0 to 4.0 mmol / l (Note that it was found errors in filling insulin syringes), an HBA1C at 9% with non-compliance with the zoning. Fever, night sweats, recent weight loss or anorexia with absence of tuberculosis infection have not been reported. On examination, the patient was conscious, in good hemodynamic and

respiratory state, her body mass index (BMI) was 24.89kg / m2 her capillary blood sugar level was 5.0mmol / L. She had a right hemiplegia with muscular forces which were rated at 4/5 th, with osteotendinous reflexes retained on the left and reduced on the right. She had a subcutaneous collection located in the supraxiphoid region of a firm and painless character. On pleuropulmonary examination the vibrations were abolished on the right with dullness to the percussion of the right lung and auscultatory silence at the base. The blood ionogram was without abnormality (no dysnatremia). CRP was increased to 32.14 mg / l, serum creatinine was normal with a glomerular filtration rate (GFR) which was 147ml / min.

The blood count had objectified a lymphopenia at 600 UL + a thrombocytosis at 547 UL, the cytobacteriological study of the urine had noted hyper leukocyturia at 73,000 / 103 without isolated germ, immunological assessment of the anti-body DNA, TPO and anti-phospholipids. negative with positive ANA and anti-transglutaminase IgA and IgG antibodies. The ultrasound revealed a sternal cortex that appeared to be discontinuous, suggesting bone lysis. On the chest x-ray it was noted a poorly systematized opacity of the lower half of the right lung. Faced with this initial assessment, tuberculosis was strongly suspected. The test for Koch's bacillus in the sputum (3BK sputum) came back negative. However, the expert gene test for cold abscess pus came back positive. The Rapid HIV Test was negative. With thoracic computed tomography (CT), it was objectified on the sections passing through the abdomen of multiple hepatic collections of segments II V VI VII and VIII enhanced at the periphery, the largest of which measured 22.5 × 21mm, suggesting hepatic abscesses In addition, the cerebral CT: the 1st to objectify a deep parietal hypodensity and left capsulo-lenticular, the 2nd showed a temporo- parietal hypodensity left cortico sub-cortical systematized, of similar density to that of the CSF fluid, seat of calcifications and collateral circulations, responsible for a widening of the cortical grooves opposite and an attraction with dilation of the ipsilateral lateral ventricle suggesting a sequellary lesion of ischemic stroke of the territory of the left middle cerebral artery.

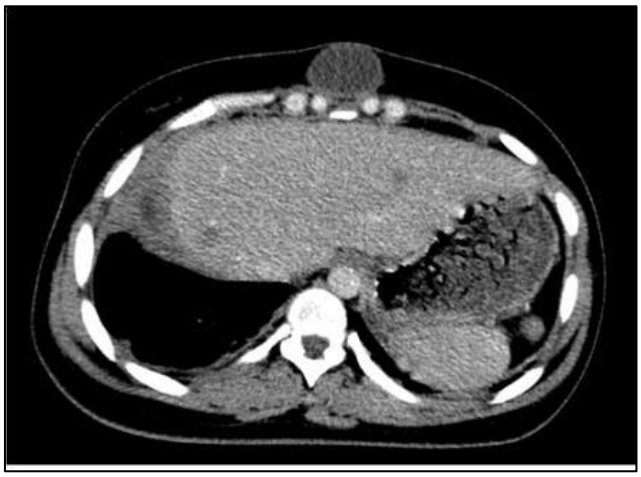

Figure 1: Abdominal CT scanAppearance in favor of sternal osteitis withcollection of opposite mole

Figure 2: Chest x-ray: poorly systematized opacity of the lower half of the

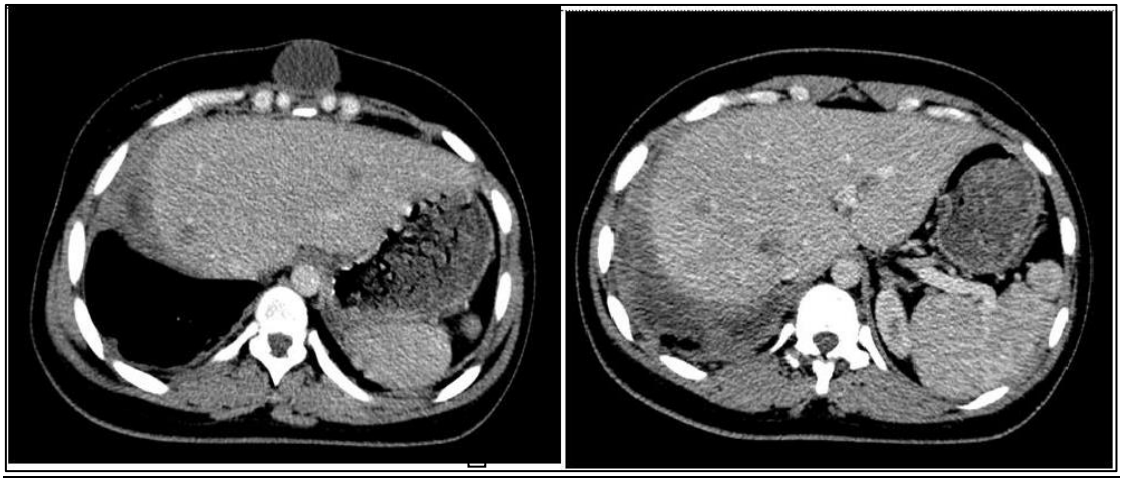

Figure 3: Abdominal CT scan: Appearance of multiple hepatic collections of segments II VVI VII and VIII

The management had consisted in adjusting the insulin doses, with close monitoring of capillary blood glucose levels. In front of this table, the setting on anti-bacillary was indicated according to the ERIPK4 scheme Ethambutol, rifampicin, Isoniazid, pyrazinamide, with control of transaminases. The course was marked by the onset of digestive intolerance to anti-bacilli, hepatic cytolysis and diabetic ketoacidosis after one week of introduction of the anti-bacillary.

DISCUSSION

Tuberculosis associated with diabetes remains a major public health problem, particularly in our developing countries. The prevalence of diabetes varies from 2.1% to 6.7% in populations of tuberculosis patients in Africa [6]. Indeed, diabetes is recognized as an important cause of reactivation of tuberculosis, and at the same time tuberculosis could worsen diabetes through infection, as evidenced by inducing the use of high doses of insulin in diabetic patients [7]. Type 2 diabetes was the most common in most patients up to 77.5%, but type 1 diabetes was more common in young people. Indeed, diabetes mellitus increases the risk of infectious disease and predisposes patients to the development of tuberculosis. It has been clearly shown that the risk of developing extra-pulmonary disorders is proportional to the degree of the immune deficiency [3].

Chen Yuan chiang *et al*., showed that the association between diabetes and clinical manifestations of pulmonary tuberculosis was related to blood sugar control: patients with poor blood sugar control had more symptoms and were more likely to have a high grade of smear [8]. This suggests that proper glycemic control may reduce the frequency of symptoms, and smear positive, hence the risk of transmission of TB infection [8]. According to S. V. B. V. Shivakumar *et al*., 75% of patients whose diabetes was known and newly detected and who had HbA1c ≥ 7.0% would have a 2- to 4-fold increased risk of contracting tuberculosis and an increased risk of microvascular and macrovascular complications [9]. Due to the parallel epidemics of tuberculosis and diabetes, the World Health Organization (WHO) in 2011 recommended surveillance of tuberculosis in patients with diabetes. population at risk could reach more than 100 cases per 100,000 inhabitants, therefore screening tests for diabetes in tuberculosis patients have also been recommended in all countries [10].

A history of pulmonary tuberculosis and tuberculosis contagion was found in 20% and 41.7% of cases in certain series [11]. In our patient, no history of tuberculosis contagion was noted. The tuberculous lesions had developed silently in our patient's case, similar to the cases reported in a study in BAMAKO, Mali where the tuberculosis lesions had developed in 91.7% of cases in a silent form in most diabetic patients, and where the discovery of tuberculosis was made following the systematic examination [7]. Our diabetic patient had a rare case with a quadruple tuberculosis localization in a context of immunosuppression. Similar cases have been reported with double extra-pulmonary locations in 75.5%, triple in 20.4% and quadruple in 3.7% [12]. The localization was pulmonary, hepatic, cutaneous and bone in our patient. The lymph node location was the most frequent in the different series reported easily contributing to the diagnosis by its accessibility to the pathological examination as well as the pulmonary involvement associated with at least two extra pulmonary locations, the osteo-articular involvement is noted in 1 to 5% of cases depending on the series. Skin involvement is classified as the fifth localization and represents an easily diagnosed form [3]. While hepatic localization is a very rare form of extra-pulmonary tuberculosis. Indeed, tuberculous liver abscess is usually secondary at other primary foci of the body, in particular pulmonary and gastrointestinal. It is rare to find a primary tuberculous liver abscess, with a prevalence of 0.34% in patients with hepatic tuberculosis. The co-authors

reported a case with direct invasion of the anterior abdominal wall of an isolated tuberculous parenchymal hepatic abscess, caused by the Mycobacteriumtuberculosis complex, diagnosed mainly on smears for fast acid bacilli (AFB), by imaging and isolated by culture [13].

The history of cerebrovascular accident was found in our patient with sequelae that the patient had such as right hemiplegia and aphasia. Consequential lesions of ischemic stroke of the territory of the left middle cerebral artery were objectified on the scene images. In fact, thromboembolic complications have been reported with pulmonary and extra-pulmonary tuberculosis localizations [14, 15]. These complications can involve different localizations including cerebral localization [16]. However, upon diagnosis of multifocal tuberculosis, the diagnosis of stroke was questioned, and cerebral tuberculosis involvement was strongly suspected, then ruled out following the realization of 'a control scanner which had objectified a cerebral image in favor of an ischemic stroke. According to Shiva Kumar *et al*., 75% of patients with known and newly diagnosed diabetes who had an HbA1c ≥ 7.0% would be 2 to 4 times more likely to develop tuberculosis and an increased risk of microvascular and macro-vascular complications [9].

It is recommended by WHO to switch to insulin in diabetics on oral antidiabetic drugs in the event of an infection [7]. For our patient, since she was already on insulin, she just needed an adjustment of the insulin doses, with close monitoring of capillary glycemia. The patient was put on anti-bacilli according to the ERIPK4 scheme: rifampicin, isoniazid, ethambutol, and pyrazinamide, with a protocol of 9 months of treatment duration as well as a check-up of transaminases each month The response of the diabetic patient to antituberculosis treatment was linked to good short-term glycemic control, and the control of HBA1C in the medium and long term [12]. The optimal treatment strategy for diabetes-tuberculosis co-infection has remained uncertain to date [17]. Chronic uncontrollable hyperglycemia in patients with diabetes increases the incidence of anti-tuberculosis treatment failure. In addition, diabetes is also associated with deaths from tuberculosis infection and relapse of tuberculosis infection. Treatment of tuberculosis in tuberculosis patients with diabetes does not differ from that in patients without diabetes. Insulin is becoming the main treatment for controlling hyperglycemia [17]. Diabetes does not alter the pharmacokinetics of anti-tuberculosis drugs during the intensive phase of tuberculosis treatment [8]. In this case, the anti-tuberculosis drug intolerance that developed after one week was not related to her diabetes and was only a common side effect caused by anti-tuberculosis treatment. Celiac disease was also diagnosed in our case and a gluten-free diet was indicated. The patient had several miscarriages and a stroke possibly related to vasculitis, a manifestation accorded to her autoimmune polyendocrinopathy. The diagnosis of antiphospholipid syndrome could not be ruled out, due to incomplete immunologies (circulating anticoagulant lupus was not available). In addition, the association of celiac disease and tuberculosis has also been reported in several series. In a British study, six of 76 adult patients with celiac disease reported a history of tuberculosis and seven others had radiological signs of tuberculosis [18]. This study was limited to a small series however, in 2007 the research group.

Ludvigsson *et al*., studied the risk of tuberculosis in 14,335 people with celiac disease in a Swedish cohort study, and found that these celiac patients are at high risk, more than 4 times that general population, to develop tuberculosis [19]. Our patient had never been tested for celiac disease or tuberculosis before, and miscarriages had never been studied before. The chronology of appearance of all these pathologies cannot be determined. Therefore, the cause and effect relationship (celiac disease / tuberculosis) cannot be certain.

CONCLUSION

Multifocal tuberculosis is a serious form, it is often perceived as the prerogative of the immunocompromised subject, its occurrence in seronegative diabetic subjects, even if exceptional, is possible, as was the case with our patient. In our context, it is necessary to develop a prophylactic and therapeutic strategy adapted to this type of patient.

RÉFÉRENCES

1. Yacoub, S., Belhabib, D., & Fekih, L. (2009). La tuberculose multifocale: à propos de cinq cas. *Rev Mal Resp*, *26*, 133.
2. El Hachimi, K., Zaghba, N., Benjelloun, H., & Yassine, N. (2016). La tuberculose multifocale: à propos de 52 cas. *Revue des Maladies Respiratoires*, *33*, A167-A168.
3. Rezgui, A., Fredj, F. B., Mzabi, A., Karmani, M., & Laouani, C. (2016). Multifocal tuberculosis in immunocompetent patients. *The Pan African Medical Journal*, *24*, 13-13.
4. Safar, J. **(**2016). Association de la tuberculose et du diabète dans la région des grands-lacs. *Diabète & metabolism*, 42, A59.
5. Benkhalifa, R. A., Moslem, N., Boukhris, N., & Chelghoum, A. (2012). P138 Un diabète comme seul facteur de risque d'une tuberculose pseudo-tumorale multifocale: À propos d'un cas. *Diabetes & Metabolism*, *38*, A64.
6. Baldé, N. M., Camara, A., Camara, L. M., Diallo, M. M., Kaké, A., & Bah Sow, O. Y. (2006). Tuberculose et diabète à Conakry, Guinée: prévalence et caractéristiques cliniques de l'association. *Int J Tuberc Lung Dis*, *10*(9), 1036-1040.

7. Diarra, B., Diallo, A., Maiga, M., Sanogo, M., Diallo, M. H., Baya, B., ... & Diallo, S. (2014). Tuberculosis and Diabetes in Bamako, Mali prevalence, clinical and epidemiological features of the association. *Revue Malienne d'Infectiologie et de Microbiologie*, *2*, 24-32.
8. Chiang, C. Y., Bai, K. J., Lin, H. H., Chien, S. T., Lee, J. J., Enarson, D. A., ... & Yu, M. C. (2015). The influence of diabetes, glycemic control, and diabetes-related comorbidities on pulmonary tuberculosis. *PloS one*, *10*(3), e0121698.
9. Shivakumar, S. V. B. Y., Chandrasekaran, P., Kumar, A. M. V., Paradkar, M., Dhanasekaran, K., Suryavarshini, N., ... & Gupta, A. (2018). Diabetes and pre-diabetes among household contacts of tuberculosis patients in India: is it time to screen them all?. *The International Journal of Tuberculosis and Lung Disease*, *22*(6), 686-694.
10. Suwanpimolkul, G., Grinsdale, J. A., Jarlsberg, L. G., Higashi, J., Osmond, D. H., Hopewell, P. C., & Kato-Maeda, M. (2014). Association between diabetes mellitus and tuberculosis in United States-born and foreign-born populations in San Francisco. *PloS one*, *9*(12), e114442.
11. Diatta, A., Ndiaye, E., Dia, Y., Cissé, M., Thiam, K., & Toure, N. (2016). Tuberculose multifocale: profil Clinique, para clinique et thérapeutique à propos de 60 cas. *Revue des Maladies Respiratoires*, *33*, A164.
12. Bitchong, C. E., & Ze, E. A. (2016). La tuberculose multifocale à l'hôpital Jamot de Yaoundé: aspects épidémiologiques, cliniques et évolutifs. *Revue des Maladies Respiratoires*, *33*, A166.
13. Pandya, J. S., Kandekar, R. V., Tiwari, A. R., Kadam, R., & Adhikari, D. R. (2016). Primary liver abscess with anterior abdominal wall extension caused by Mycobacterium tuberculosis complex. *Journal of Clinical and Diagnostic Research: JCDR*, *10*(11), PD08.
14. Gogna, A., Pradhan, G. R., Sinha, R. S. K., & Gupta, B. (1999). Tuberculosis presenting as deep vein thrombosis. *Postgraduate medical journal*, *75*(880), 104-106.
15. Mohan, B., Kashyap, A., Whig, J., & Mahajan, V. (2011). Pulmonary embolism in cases of pulmonary tuberculosis: a unique entity. *Indian J Tuberc*, *58*(2), 84-87.
16. Mark, P. L., Ashok, P. P., Deshpande, R. B., & Mahashur, A. A. (2009). A patient with hypercoagulable state due to tuberculosis. *The Indian journal of chest diseases & allied sciences*, *51*(1), 49-51.
17. Novita, B. D., Pranoto, A., Soediono, E. I., & Mertaniasih, N. M. (2017). A case Risk- Study of Lactic Acidosis Risck in Metformin Use in Type 2 Diabetes Mellitus Tuberculosis co-Infection Patients, *IJTB*, 205.
18. Williams, A. J., Asquith, P., & Stableforth, D. E. (1988). Susceptibility to tuberculosis in patients with coeliac disease. *Tubercle*, *69*(4), 267-274.
19. Ludvigsson, J. F., Wahlstrom, J., Grunewald, J., Ekbom, A., & Montgomery, S. M. (2007). Coeliac disease and risk of tuberculosis: a population based cohort study. *Thorax*, *62*(1), 23-28.