



Persistent Cutaneous Metastatic Tubercular Abscesses Revealing Multifocal Tuberculosis in an Immunocompetent Patient

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Authors' contributions

This work was carried out in collaboration among all authors. All authors participated in the collection of data, writing of the manuscript and literature review. All authors have read and approve of the submitted manuscript.

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Case Study

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ABSTRACT

Tuberculosis remains one of the infections with high mortality rate. Multifocal tuberculosis usually affects immune compromised patients such as Human Immunodeficiency virus carriers. However, patients with no underlying immunodeficiency may still present an extensive and atypical form of tuberculosis. We hereby report the case of a 16-year-old female patient presenting persistent and multiple cutaneous lesions associated with fatigue and loss of appetite which led to the diagnosis of disseminated, multifocal tuberculosis with neurological, musculoskeletal, genital, pulmonary, peritoneal and lymph nodes involvement. Screening for potential underlying immunodeficiency yielded no results. Clinical and radiological outcome was favorable on anti-tuberculosis drugs with complete regression of identified lesions. This case serves as a reminder that tuberculosis remains

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a challenging diagnosis that encompasses a variety of clinical presentation ranging from cutaneous abscesses to life-threatening conditions such as cerebral tuberculomas even in immune competent patient.

Keywords: Tuberculosis; metastatic tubercular abscesses; multifocal tuberculosis.

1. BACKGROUND

Tuberculosis, a curable infectious disease once thought to be a death sentence, still remains as one of the 10 leading causes of death worldwide [1,2]. Lungs were classically the primary target for tuberculosis, but these recent years, extra-pulmonary tuberculosis has become more frequent especially with the increase in Human Immunodeficiency Virus (HIV) infection rates [3]. This resulted in a large diversity in clinical presentations. Cutaneous involvement is rare in tuberculosis as it accounts for 1 to 2% of cases even in endemic countries [4]. Cutaneous lesions as the first sign of multifocal tuberculosis are even more exceptional. Such presentations usually concern immunocompromised patients, resulting in a higher mortality rate.

We hereby report the case of a 16-year-old female patient presenting with cutaneous metastatic tubercular abscesses revealing a disseminated, multifocal tuberculosis with neurological, musculoskeletal, genital, pulmonary, peritoneal and lymph nodes involvement. Investigations for underlying immunodeficiency were negative. Anti-tuberculosis drugs allowed a complete recovery.

2. CASE PRESENTATION

A 16-year-old female patient was admitted for a three-month history of multiple persistent, abscess-like cutaneous lesions. She had no medical history and she denied the use of illicit drugs and intravenous narcotics. She reported recent fatigue, loss of appetite as well as recurrent headache and back pain without fever. She had received multiple antibiotics during these three months with no significant improvement. Skin examination revealed a well-defined, painful ulcer measuring 2.5 cm at the side of the right leg (Fig. 1) as well as 4 nodular lesions located at the forehead (Fig. 2), scalp, right thumb, and the anterior thoracic wall. In addition to these cutaneous lesions, clinical examination showed palpable centimeter-sized painless cervical lymphadenopathy. Diffuse abdominal tenderness was noted as well as a tender mass measuring 7 cm on the right iliac

region. Clinical examination was otherwise unremarkable. Laboratory routine tests showed evidence of inflammation with C-reactive protein: 88mg/l, erythrocyte sedimentation rate: 112mm-H1 and elevated fibrinogen serum level of 5.3 g/l. Complete blood count revealed microcytic anemia with hemoglobin of 9.1 g/dl and mean corpuscular volume of 76 fl. White blood cells and platelet count was within normal range respectively at 7830/mm³ and 345000/mm³. Lymphocyte count was normal: 1640/mm³. Iron balance tests showed ferritin serum level at 220 ng/ml. Liver function tests showed cholestasis with increased serum level of both gamma-glutamyl transferase: 86 U/L (normal range: <36 U/L) and alkaline phosphatase: 284 U/L (normal range: <175 U/L). Total serum bilirubin was normal and no cytolysis was noted. Renal function tests were within laboratory range. Skin biopsy was performed on the ulcerous lesion of the right leg. Histological examination revealed the presence of caseating granulomas associated with a mixed inflammatory infiltrate. Tuberculin skin test was strongly positive. Thus, the diagnosis of cutaneous tuberculosis in the form of tubercular abscesses was made and investigations to identify other organ involvement were initiated.

Sputum smear and culture both showed no evidence of acid-fast bacilli. Abdominal and pelvic ultrasound revealed two intra-abdominal heterogeneous fluid collections on both sides of the uterus. Further investigations by computed tomography (CT) of the abdomen and pelvis confirmed these collections to be bilateral large pyosalpinx measuring 65*25 mm on the right and 45*27 mm on the left (Fig. 3). It also revealed spleen enlargement; coeliac, mesenteric and bilateral iliac lymphadenopathy; diffuse peritoneal thickening with peritoneal nodules and a 5 cm collection of the left psoas muscle. Chest CT noted the presence of multiple necrotic mediastinal lymph nodes as well as bilateral small pulmonary nodules and apical parenchymal scarring of the right lung. It also showed lytic bone lesions of the sternum and the left clavicle associated with a 2 cm retrosternal collection.

As the patient reported recurrent headaches and given the extensiveness of the infection, a cerebral CT was requested. It revealed two contrast-enhanced nodular lesions of the right frontal and left parietal regions suggestive of cerebral tuberculomas. These findings were confirmed by cerebral and medullary magnetic resonance imaging (MRI) which also noted heterogeneous increased intensity lesions of the vertebral body on T2 weighted sequences affecting the whole spine and the sacrum suggestive of infectious Spondylodiscitis (Fig. 4). It also revealed epiduritis between D1-D3 spinal levels. Histological examination of CT-guided fine needle vertebral biopsy showed similar findings to skin biopsy with caseating granulomas and rich inflammatory infiltrate.

The diagnosis of disseminated multifocal tuberculosis with cerebral, pulmonary, genital, peritoneal, musculoskeletal, cutaneous and lymph nodes involvement was made with skin lesions being the presenting feature. Given such extensive lesions in a young patient with no known medical history, we performed a screening for an underlying immunodeficiency. She had no history of diabetes and her kidneys function tests were normal. She did not receive long-term immunosuppressive therapy. Serology of HIV and viral hepatitis were negative. The different serum immunoglobulin concentrations were within normal range. Lymphocyte proliferation test and lymphocytes phenotyping were without abnormalities. Study of Interleukin 12 and Interferon-gamma mediated-immunity was normal. Anti-tuberculosis drugs were initiated in association with a brief corticosteroid

therapy given the presence of neurological involvement. Rigid reinforcement of the spine with a corset was also indicated. Clinical and radiological outcome was favorable. After one month, the patient started gaining weight and appetite. She also reported partial regression of headaches. At four months, cutaneous lesions regressed almost completely leaving pigmented scars. Anti-tuberculosis treatment was maintained for 12 months.



Fig. 1. Ulcer at the lateral side of the right leg with clear-defined limits



Fig. 2. Two centimeter sized non-inflammatory nodular lesions of the forehead

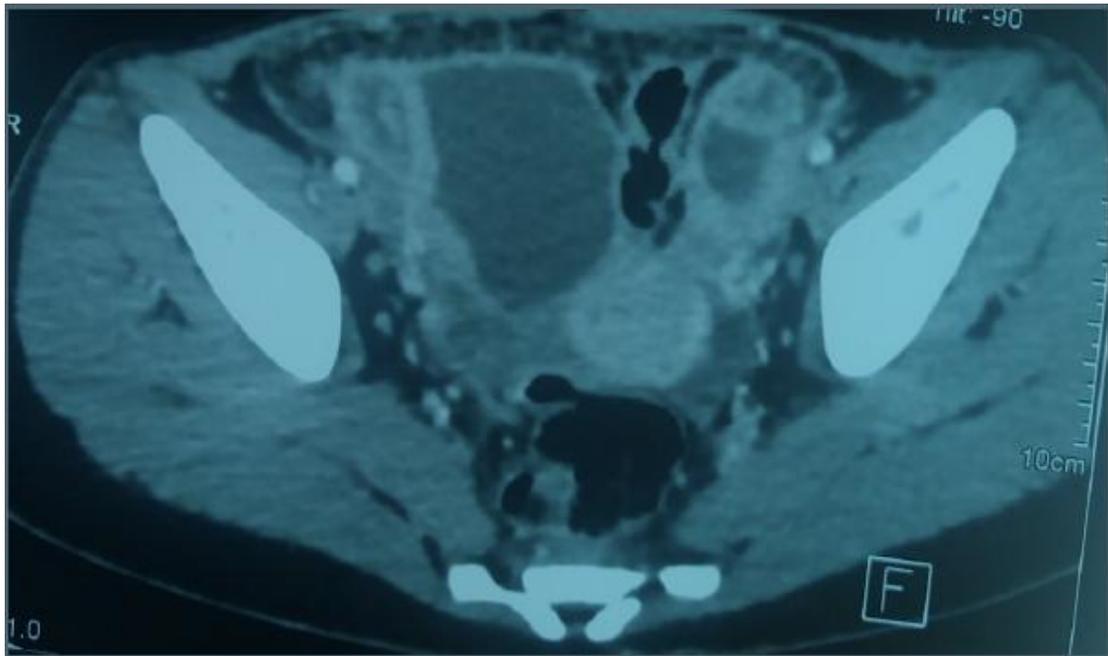


Fig. 3. Computed tomography of the pelvis showing bilateral pyosalpinx

A follow-up full-body CT showed complete regression of cerebral tuberculomas as well as the psoas muscle abscess, the bilateral pyosalpinx and the retrosternal collection with the associated lytic bone lesions. Follow-up spine MRI showed sequelae of some vertebrae with no evidence of active infection. At present, after one year and a half, the patient is in good health and shows no signs of recurrence.

3. DISCUSSION

We herein report the case of a female patient presenting with persistent cutaneous lesions associated with fatigue and loss of appetite that eventually led to the diagnosis of disseminated, multifocal tuberculosis with life-threatening organ involvement such as cerebral tuberculomas. Such clinical presentation usually affects immunocompromised patients, which prompted us to investigate potential immunodeficiency. However, no such underlying condition was found in our patient. Clinical and radiological outcome was favorable on anti-tuberculosis drugs, yet the question remains as to why an immunocompetent young patient presented such an extensive form of tuberculosis.

Multifocal tuberculosis is defined as the involvement of at least two extra-pulmonary foci with or without pulmonary involvement as was

portrayed in this case. It accounts for 10% of tuberculosis [5]. Higher mortality rate observed with multifocal tuberculosis could be linked to the severity of such presentation and the usually important delay in diagnosis and to the fact that it often occurs in immunocompromised patients [6]. Such presentation increase in frequency might be linked to the important spread of HIV infection during the last decade. Multifocal tuberculosis may affect the skin with a variety of clinical manifestations one of which is multiple cutaneous abscesses.

Cutaneous tuberculosis is rare, even more in an immunocompetent patient, and only a few cases have been described [7,8]. Metastatic tubercular abscesses are a rare and clinically misleading form of cutaneous tuberculosis. Whereas other forms may result from an underlying infectious site (lymphadenitis, bone), metastatic abscesses are caused by hematogenous dissemination of *Mycobacterium tuberculosis* [9]. It is primarily seen in immunocompromised patients and is commonly located on the extremities. Multiples lesions may be observed simultaneously especially in immunocompromised patients. It is infrequently reported as the first sign of multifocal tuberculosis [8]. The patient reported is atypical on two accounts: She is an immunocompetent young girl with multiple tubercular abscesses as an initial presentation.



Fig. 4. Spine MRI of the lumbar region showing heterogeneous increased intensity lesions suggestive of infectious spondylodiscitis

Clinically, tubular abscesses usually manifest as erythematous non-tender nodules of variable size on the extremities closely mimicking pyogenic infections [8,9]. This may explain the numerous antibiotics received by our patient and the diagnostic delay before skin biopsy was performed. Tuberculosis should always be considered in case of chronic refractory cutaneous lesions especially in endemic areas.

Laboratory test did show moderate cholestasis in addition to evidence of inflammation. Such results were considered as most likely linked to tuberculosis even in the absence of radiological signs of liver involvement. In fact the patient had peritoneal involvement and thus contiguous injury of the liver was suspected.

Diagnosis of multifocal tuberculosis is challenging given the diversity of involved organs and clinical polymorphism. As such, radiological investigations are of the most important. They allow detecting early, sometimes asymptomatic, organ involvement [7,8]. This was observed in

our patient, who did not have any respiratory complaints while CT showed signs of pulmonary tuberculosis.

Out of the organ involved, our patient had bilateral pyosalpinx. Genital involvement in tuberculosis is rare highlighting the unique presentation of our patient [10]. Not only our patient had bilateral pyosalpinx but she was only 16 whereas genital involvement in tuberculosis usually affects women of reproductive age. In the study of Efares et al, only one patient was less than 20-year-old [10]. Our patient was in addition sexually inactive which supposes hematogenous spread. Both fallopian tubes are involved in more than 90% of patients [11].

Our patient also presented musculoskeletal involvement both spinal and extraspinal with lytic bone lesions of the sternum and clavicle. Concomitant skin and skeletal involvement is a rare occurrence especially as extraspinal skeletal tuberculosis account for 1 to 2% of cases [7,12].

Identifying potential immunodeficiency is mandatory in patients presenting multifocal tuberculosis. This includes screening for diabetes, chronic kidney disease, HIV infection and immunosuppressive therapy [7]. Interleukin-12 and interferon axis malfunction have also been reported as a susceptible condition for disseminated tuberculosis [13]. Some factors have been suspected to facilitate the occurrence of multifocal tuberculosis in immunocompetent patients such as promiscuity in endemic zones, malnutrition, and delay in diagnosis and initiating therapy [6].

Taken together, our report illustrates the possibility of multifocal tuberculosis in immunocompetent patients with no risk factors. It also shows that a symptom such as cutaneous abscess could be the first sign of a life-threatening condition like multifocal tuberculosis. Relative delay in diagnosis and therapy could have been an important factor leading to multifocal tuberculosis.

4. CONCLUSION

Multifocal tuberculosis, although more frequently observed in immunocompromised patients, may also affect patients with a normal immunity. As such, even in immunocompetent and asymptomatic patients, screening to identify other organs involvement is necessary. Investigations regarding immunodeficiency must

be carried out in patients with multifocal tuberculosis. Early diagnosis and management of tuberculosis may allow reducing the incidence of multifocal and extensive tuberculosis.

CONSENT

As per international standard or university standard, patient's consent has been collected and preserved by the authors.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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