***Case report***

***Multifocal Tuberculosis Revealed by Cutaneous Abscesses in an Immunocompetent Patient***

***Abstract***

Multifocal tuberculosis (MTB) is defined as the involvement of two or more non-contiguous extrapulmonary sites, with or without associated pulmonary TB. It is a rare and severe form, accounting for only 10% of extrapulmonary TB cases. Multifocal TB can affect immunocompetent individuals. Its varied presentation can mislead clinicians, emphasizing the need for a thorough assessment of TB dissemination. This study presents the case of 26-year-old male who had a year-long history of pelvic and spinal pain, without signs of enthesitis or peripheral involvement. Bone biopsy confirmed granulomatous tuberculoid inflammation without necrosis, strongly suggesting multifocal tuberculosis (bone and skin). The patient received anti-tuberculosis treatment with rifampicin, isoniazid, pyrazinamide, and ethambutol for two months, followed by rifampicin and isoniazid alone to complete a 12-month course.

**Presentation of multifocal tuberculosis is rare but is possible in the immunocompetent host; thus, it should be kept in the differential diagnosis even in the absence of immunosuppression. Imaging and histopathological studies aid in confirming the diagnosis allowing for early and appropriate anti-tuberculosis treatment. The case presented illustrates the importance of considering broad differential diagnoses when managing some atypical and disseminated infections.**

***KEYWORDS:***

***Multifocal tuberculosis - immunocompetent individuals - mycobacterium tuberculosis - granulomatous tuberculoid inflammation - cutaneous abscesses - osteoarticular tuberculosis - tuberculosis sacroiliitis - extrapulmonary tuberculosis - bone biopsy - MRI in tuberculosis – histopathological diagnosis - anti-tuberculosis treatment***

* **Introduction :**

Tuberculosis (TB) is an infectious disease caused by the bacterium Mycobacterium tuberculosis. It’s estimated that about a quarter of the global population has been infected with the TB bacillus. However, only 5–10% of those infected eventually develop a symptomatic form of the disease, according to a 2024 WHO study (1).

In Morocco, thanks to the national strategic plan, TB incidence and mortality dropped by 19% and 6% respectively between 2000 and 2023 (2). This decline is mainly due to primary prevention via vaccination and early detection and treatment.

Multifocal tuberculosis (MTB) is defined as the involvement of two or more non-contiguous extrapulmonary sites, with or without associated pulmonary TB. It is a rare and severe form, accounting for only 10% of extrapulmonary TB cases. While it is most often seen in immunocompromised individuals, it can also occur in immunocompetent patients. Prompt initiation of anti-tuberculosis therapy is crucial to avoid long-term complications.

Here, we report a case of multifocal tuberculosis in an immunocompetent patient.

* **Case presentation :**

A 26-year-old male with a history of chronic smoking (3.5 pack-years) and known TB contact one year earlier, presented with a year-long history of pelvic and spinal pain without signs of enthesitis or peripheral involvement. Six months later, he developed multiple skin abscesses that did not respond to antibiotics, along with general health deterioration (marked by weight loss and absence of fever).

On admission, he was afebrile. Clinical examination revealed neck stiffness with tenderness at C5-C6, spinal deformity (scoliosis), positive monopod and tripod signs, and multiple fluctuating, inflamed subcutaneous swellings (total of 4), mainly in the supraclavicular region and on the right elbow and wrist. The largest lesion measured 5 cm; one was ulcerated with jagged edges. No neurological, pulmonary, or lymph node abnormalities were found.

Lab tests showed significant inflammation: CRP 129 mg/L, inflammatory anemia (Hb 10.4 g/dL), thrombocytosis (470,000), high fibrinogen (4.77 g/L), and polyclonal hypergammaglobulinemia (18 g/L). No leukocytosis or lymphopenia was observed. Serologies for HIV, HBV, and HCV were negative. The dihydrorhodamine (DHR) test showed normal neutrophil function. Tumor markers were negative, and no signs of immunodeficiency were detected.

PCR analysis of abscess fluid was positive for *Mycobacterium tuberculosis*. MRI of the sacroiliac joints revealed bilateral sacral collections with some bone destruction, bilateral sacroiliitis, L5-S1 spondylodiscitis, epidural involvement, and a paravertebral abscess. A full-body CT scan showed additional disco-vertebral lesions from C5 to C7 and bilateral sacroiliac involvement, with extensive paravertebral and epidural collections from C7 to L1. Bone biopsy confirmed granulomatous tuberculoid inflammation without necrosis, strongly suggesting multifocal tuberculosis (bone and skin). The patient began anti-tuberculosis treatment with rifampicin, isoniazid, pyrazinamide, and ethambutol for two months, followed by rifampicin and isoniazid alone to complete a 12-month course. After one month, clinical condition and inflammatory markers (CRP down to 40 mg/L) improved.

* **Discussion :**

Multifocal tuberculosis is diagnosed when at least two non-contiguous extrapulmonary sites are affected, with or without lung involvement. Though rare, it has been reported in 9–10% of cases in literature (3). Diagnosis can be challenging and delayed, increasing the risk of complications and death.

Mortality ranges from 16% to 25% (4,5,6,7), especially among immunocompromised patients, notably those with HIV. However, immunocompetent individuals can also be affected.

Tuberculous spondylodiscitis is the most common osteoarticular manifestation of TB, mainly involving the thoracic and lumbar spine. Cervical involvement is rare (5% of cases (8,9)). The infection typically spreads via the bloodstream.

Imaging is critical for diagnosis. X-rays may show signs due to the chronic course but are often insufficient for soft tissue and spinal canal assessment. MRI is the gold standard, providing excellent detail on abscesses, epidural spread, and potential spinal cord compression. PET-CT can also be helpful. Imaging guides abscess aspiration or bone biopsy, essential for microbiological and pathological diagnosis.

Key MRI findings (10) include:

* Spondylitis: low T1 signal, high T2 signal with fat suppression, and uniform gadolinium enhancement.
* Paravertebral abscesses: peripheral enhancement on T1 post-contrast (target-like appearance), often “cold” (i.e., no surrounding muscle inflammation), especially when located epidurally, potentially causing neurological compression.
* Anterior epiduritis: similar imaging as spondylitis, usually lifting the posterior longitudinal ligament, forming a “double hump” or sometimes distorting the dural sac into a “star-shaped” configuration.

Bone biopsy histology is vital for diagnosis (allow the diagnosis of tuberculosis to be made, between 60 and 70% positivity (10,11,12)), showing granulomatous inflammation with epithelioid and giant cells and sometimes central caseous necrosis, highly indicative of TB. It can also rule out pyogenic infections, metastasis, or hematologic malignancy.

Cutaneous and mucosal TB ranks fifth among extrapulmonary sites (13). It may be primary (via direct inoculation) or secondary (due to hematogenous spread, nearby lymphatic or bone involvement, late reactivation, or self-inoculation). Various forms exist: gummatous TB, lupus vulgaris, miliary lupus vulgaris, verrucous TB, and orificial TB.

Our patient had gummatous TB—a form of metastatic tuberculous abscess—which appears as subcutaneous nodules on the limbs and trunk, eventually breaking through the skin to form ulcerated lesions with jagged edges and a granulomatous base (scrofuloderma) (14). These lesions often occur in the parotid, supraclavicular, and lateral neck regions.

Definitive diagnosis relies on identifying *Mycobacterium tuberculosis* in abscess fluid and histopathological confirmation via skin biopsy.

Treatment involves a 12-month anti-TB regimen. Surgery is rarely needed upfront but may be considered if medical therapy fails after 6–8 weeks.

* **Conclusion :**

Multifocal TB can affect immunocompetent individuals. Its varied presentation can mislead clinicians, emphasizing the need for a thorough assessment of TB dissemination. Prognosis is generally good, depending on the type of involvement and how early treatment is initiated.

**Ethical Approval:**

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

**Consent**

As per international standards or university standards, patient(s) written consent has been collected and preserved by the author(s).

* **References :**

(1) Tuberculosis, World Health Organization, October 29, 2024.

(2) National Strategic Plan for the Prevention and Control of Tuberculosis in Morocco, 2024-2030.

(3) Denis-Delpierre N, Merrien D, Billaud E, Besnier JM, Duhamel E, Hutin P, et al. Multifocal tuberculosis. About 49 cases in the midwest region. GERICCO (Group for Epidemiology and Research in Clinical Infections of the Central West of France), 1991-1993. Pathol Biol 1998; 46(6): 375-9.

(4) Ben Arfa, Ben Amara. Multifocal tuberculosis in immunocompetent patients. Revue des Maladies Respiratoires. 2007; 24:104.

(5) Kpossou AR, Adjadohoun S, Diallo K, Badarou S, Ngamo G, Takin R, et al. Multifocal tuberculosis mimicking multimetastatic colon cancer in an immunocompetent Black African man: a case report. Pan Afr Med J. 02 Jul 2021;39:167

(6) Di Renzo C, Tabrizian P, Kozuch DE, Fiel MI, Schwartz ME. Abdominal tuberculosis mimicking cancer clinically and on fluorodeoxyglucose (FDG) positron emission tomography (PET) imaging: a two-case series. Am J Case Rep. 2020;21:e918901

(7) Ngakoutou R, Joseph M, Ahmet A, Dieudonne D, Mbainadji L, Toralta J, Mahamat Ali B. Epidemiological, Clinical, and Developmental Aspects of Multifocal Tuberculosis in N'djamena. Health Sciences and Disease, the Journal of Medicine and Biomedical Sciences, Feb 2024, Vol 25.

(8) Kulali A, Cobanoglu S, O zyilmaz F. Spinal tuberculosis with circumferential involvement of two noncontiguous isolated vertebral levels: case report. Neurosurgery 1994, 35:1154–8.

(9) A Mounir, M Karhate Andalousi, N Akasbi, M Chakib Benjelloune, T Harzy. Noncontiguous and multivisceral multifocal vertebro-medullary tuberculosis in an immunocompetent subject. International Journal of Medicine and Surgery 2019, 6:226.

(10) Coiffier G, Bart G. Adult vertebral tuberculosis. EMC - Locomotor System 2020;34(2):1-15.

(11) Colmenero JD, Ruiz-Mesa JD, Sanjuan-Jimenez R, Sobrino B, Morata P. Establishing the diagnosis of tuberculous vertebral osteomyelitis. Eur Spine J 2013;22(Suppl. 4):579–86.

(12) Garg RK. Spinal tuberculosis: a review. J Spinal Cord Med 2011;34:440–54.

(13) A Rezgui, F Ben Fredj, A Mzabi, M Karmani, C Laouani. Multifocal tuberculosis in immunocompetent patients. Pan African Medical Journal, May 4, 2016, 24:13.

(14) J.-P Coulon, E Piette. Tuberculosis. EMC (Elsevier Masson SAS, Paris), stomatology, 22-047-A-10, 2001, Oral medicine, 28-320-C-10, 2008.