



# A Case of Pott's Disease: Cold Abscess in a Haitian Woman Presenting with Chronic Back Pain

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## Abstract

**Background:** Tuberculous spondylitis is a bacterial infection caused by *Mycobacterium tuberculosis*. This bacteria usually attacks the lungs but can attack any part of the body such as the kidney, spine, and brain. Spine being the most frequently affected site, Spinal TB patients typically present with back pain but other constitutional or pulmonary symptoms may be absent, rendering the diagnosis difficult. *Mycobacterium tuberculosis* can remain dormant for decades after the initial infection and doesn't always cause infections.

**Case:** We report a case of a 23-year-old Haitian woman who presented with increased swelling in right lower flank and vague lower back pain for two years before being diagnosed with tuberculous spondylitis.

**Conclusion:** Physicians in the USA often miss opportunities to identify patients with tuberculous spondylitis considering its endemic in various countries around the world. Symptoms may be vague and screening tests have limitations. We review current strategies for diagnosis, and treatment of tuberculous spondylitis in immigrant patients who have lived in endemic areas and discuss the clinical features and management the infection.

**Keywords:** Tuberculous spondylitis; Spinal tuberculosis; Haiti; Cold abscess; Back pain

## Introduction

Tuberculosis (TB) still remains a public health concern worldwide despite the decline in incidence over the past few years. As many as 8.6 million new cases and 1.3 million deaths were estimated to have occurred in 2012 [1]. In 2014, 1.5 million tuberculosis related deaths worldwide were reported. TB is caused by *Mycobacterium tuberculosis* which is a facultative intracellular, aerobic, acid fast bacilli (AFB) bacterium. TB is transmitted via inhalation of aerosol droplets infecting the lungs. Most commonly, typical presentation of the infection include fever, night sweats, malaise, weight loss, cough, hemoptysis. According to the World Health Organization (WHO), most cases are estimated to be in Asia and Africa (58% and 27% respectively), with the highest incidence in India (range 2.0-2.4 million) and China (0.9-1.1 million), together accounting for 38% of the total number of cases [1]. About one third of the world population has latent *M. tuberculosis* infection [2]. HIV infection in fact is the most powerful known risk factor predisposing for *Mycobacterium tuberculosis* infection and progression to active disease, which increases the risk of latent TB reactivation 20-fold [3]. This can result in many patients remaining asymptomatic and have the infection survive decades undiagnosed.

## Case Presentation

A 23-year-old Haitian woman with no previous medical history presented to Kingsbrook Jewish Medical Center (KJMC) with a chief complaint of increased swelling in the right lower flank which began to spontaneously drain one day ago. She initially noticed the swelling "about two years ago" as a small painless mass. Over the years, the mass began to progressively enlarge. She reported no fevers, chills or redness at the site. Two years prior to presentation, the patient began experiencing a dull pain, aching in nature in the midline of her back that was radiating to the right lower quadrant. Eventually the pain progressed to a constant lower back pain with the severity reaching 8/10 on the pain scale, she suggested the pain was aggravated by extended periods of both sitting and standing. One week before admission, the patient's pain began to radiate to her right pelvis and right thigh down towards her knee. She describes the pain as dull constant in nature that disturbs her sleep

causing her to wake up in pain. As a result of the progression of pain it is making it difficult to perform tasks of daily living. Along with the pain the patient noticed that prolonged periods of standing has begun to cause swelling in the lumbar area.

The patient initially sought treatment in Haiti, she only received medicine to help her with the pain. When the pain was no longer managed by painkillers she sought treatment once again, this time in New York City. The patient visited many emergency departments over a 6-month period but was discharged with no diagnosis and a prescription for acetaminophen. On review of system the patient reported an unintentional weight loss of 20 pounds over a 2-month time span she also admitted to a three-month history of debilitating fatigue but she denied any night sweats, fevers, chills, hemoptysis or dyspnea.

The patient had no significant past medical history. The patient had a family history significant for TB exposure from her father as a child. She immigrated to the USA from Haiti three years prior to presentation. The patient had no allergies and her immunization record did not indicate whether she received the BCG vaccination as a child. The patient does not use tobacco, alcohol or illicit substances. She identifies herself as a Jehovah's witness. She lives with her family and was working two jobs as a matron on a school bus and a fast food worker at the local chain restaurant, Wendy's.

On physical exam patient was a well appearing young female in moderate distress with vital signs BP 119/75, P. 107, R. 18 T97.5. Abdominal exam showed mild tenderness on palpation of the right flank with purulent material draining from a 0.5 cm opening in the

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right lower quadrant flank. Patient had no signs of guarding or rebound tenderness and no masses or organomegaly were present.

Review of her lab tests revealed hemoglobin of  $10^8$  g/L, MCV 89.6 fl, RDW 12.2%, leukocyte count  $7.8 \times 10^3/\mu\text{l}$ , and platelet count  $390 \times 10^3/\mu\text{l}$ . Other lab tests included blood urea nitrogen 7.0 mmol/L, serum creatinine  $53.04 \mu\text{mol/L}$ , AST 23 U/L, ALT 16 U/L, alkaline phosphatase 54 U/L, total bilirubin of  $8.55 \mu\text{mol/L}$  with indirect bilirubin  $8.55 \mu\text{mol/L}$ , and ESR 112 mm/hr. Rapid HIV testing was negative. Blood cultures drawn at initial evaluation remained sterile after 48 hours.

Lumbar spine imaging with and without contrast reveals indistinct soft tissue infiltration of the right midline, involving the perivertebral soft tissues. At the level of L3 vertebral body there is a focal collection measuring  $1.8 \text{ cm} \times 2.6 \text{ cm}$  directly posterior to the IVC.

A computed tomography (CT) scan of the abdomen and pelvis revealed discitis/osteomyelitis at the L4-L5 level with adjacent paraspinal and right retroperitoneal abscess extending to the right lower flank subcutaneous tissue (Figure 1). The CT also revealed multiple distinct abscess collections that appear to be contiguous with the paraspinal involvement. The enhancement suggests both septic and tuberculous disease processes. A follow-up magnetic resonance imaging (MRI) of the lumbar spine with and without contrast confirmed these findings of discitis and osteomyelitis at L4-L5 with an expansile abscess extending into subcutaneous tissue (Figure 2).

The patient was admitted to KJMC, she was given a PPD test and underwent paraspinal abscess drainage through paravertebral muscles the following day. Part of the wall of the abscess and material from within the abscess was collected in the OR. The PPD was read as a positive, two days later. Given her history and presentation, tuberculous with cold abscess was high on our differential.

The patient was placed on contact isolation and empirically started on the standard anti-TB regimen. Of the two samples collected, one was granulomatous material which showed chronic inflammatory cells with occasional multinucleated giant cells. The second the wall of the abscess; showed multinuclear giant cells surrounding amorphous material in the background of inflammatory cells. Both specimens were stained

and cultured for acid fast bacillus and results were negative and no acid-fast bacilli were identified. The presence of multinucleated giant cells in the wall of the abscess as well as the patient's presentation and recent immigrant status, helped us make the diagnosis of tuberculous spondylitis with cold abscess.

## Treatment

There are numerous treatment options for tuberculosis, but the five 1<sup>st</sup>-line drugs include: rifampicin, isoniazid, pyrazinamide, ethambutol and streptomycin. Ethambutol can be discontinued once there is confirmation of susceptibility to rifampin, isoniazid, and pyrazinamide. In young children, ethambutol should be avoided due to its toxic side effects. In most cases, 6 months to 12 months of chemotherapy is necessary in preventing possible drug-resistant disease in the course of tuberculosis treatment [4]. The gold standard of treatment now is an introductory phase regimen of at least rifampin, isoniazid, and pyrazinamide for 2-months, with an additional 4-months of isoniazid and rifampin. With prolonged multidrug regimens, there is the possibility of harmful side effects, which include, arthralgia, gastrointestinal disorders, allergic reactions and hepatotoxic effects [5]. Surgical decompression is indicated for patients with active tuberculosis infecting the spine and associated neurologic compromise [4].

## Discussion

Tuberculosis (TB) is defined as a disease caused by members of the *M. tuberculosis* complex. This complex is distinguished by its intricate envelope constituents [6]. The mycolic acid is the major component of the cell envelope which gives the bacterium its staining properties and aids in the diagnosis of the disease [7,8]. The ability of the mycolic acid structure to resist destaining by acid alcohol after being stained by aniline dyes coins the term of the bacterium to be an acid-fast bacilli (AFB). The procedure that is most commonly used to diagnose TB is through microscopy of the acid-fast bacillus (AFB). One limitation this method faces is that a specimen with at least 104 colony forming units (CFU)/mL or more is needed to produce a positive smear [9]. Other measures can be used to identify *M. tuberculosis* as the organism has a unique slow growth rate, where its generation time is about 20 to 24 hours. One hallmark of tuberculosis is a granuloma as it creates an immune environment for which the infection can be controlled [10,11]. Granulomas consist mainly of macrophages, epithelioid cells and multinucleated giant cells (also known as Langhans giant cells), surrounded by T lymphocytes [12,13]. Multinucleated giant cells result from the fusion of macrophages and are a characteristic finding of tuberculosis [14].

It is critical to recognize the epidemiology of tuberculosis in order to have the most effective control of the disease. Peaking around 2003, the worldwide incidence of TB has been slowly declining. According to World Health Organization, 10.4 million individuals were diagnosed with TB in 2015 and 1.8 million individuals died [15]. Rates of TB are higher in sub-Saharan Africa, India, the islands of Southeast Asia and Micronesia, and Haiti which are ranked as the highest worldwide. While the USA, Western Europe, Canada, Japan and Australia are ranked with the lowest rates of less than 25 cases per 100,000 [15]. Testing for TB in individuals from the highest rated countries is crucial to rule out the disease. There are two ways to test if an individual has been infected with TB in the body, with TB skin test and TB blood test. If either is positive, then further testing with chest x-rays, sample sputum to check whether an individual has TB disease [16].

Spinal tuberculosis (Pott's disease) is a common complication of TB which can lead to spinal cord compression and spinal deformity if

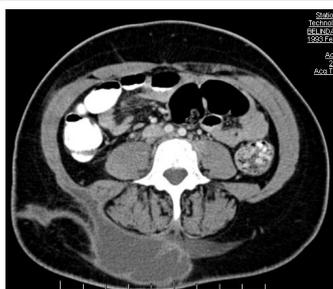


Figure 1: CT at level L4-L5 showing right paraspinal abscess with cutaneous fistula drainage.



Figure 2: MRI showing osteomyelitis at the L4-L5 level.

there is any delay in diagnosis and treatment [17]. Patients with Pott's disease will first present with back pain as the earliest symptom usually weeks before seeking help from a physician [18]. Associated symptoms of fever, weight loss and muscle spasms can be seen in patients when diagnosed with Pott's disease and last up to 4 months typically or longer [18]. The thoracic spinal region is the most common area that is affected by TB and leads to symptoms such as leg weakness, gibbus, pain and a palpable mass [17]. Patients from endemic areas of TB often show clinical manifestations of spinal tuberculosis late in disease since they have limited access to medical care [19].

## Conclusion

In conclusion, tuberculosis is still a public concern worldwide, practitioners should have a strong level of suspicion if a patient has a history of prior exposure or immigrates to the USA from endemic areas, such as Haiti. Therefore, a detailed history and physical with further testing is necessary to rule out TB in patients who carry significant risk. This is imperative to prevent further complications, such as tuberculous spondylitis, and in general the spread of infection. We recommend PPD testing in all immigrants to the USA and a strong suspicion for tuberculous spondylitis in immigrant patients presenting with back pain and previous exposure to TB.

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