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Zachary Ciochetto  
*Henry Ford Health System*

Michel Hanna  
*Henry Ford Health System*

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# Tuberculous Peritonitis: A Surprise Diagnosis For Abdominal Pain



HENRY FORD  
MACOMB HOSPITAL

Zachary Ciochetto, MD, Michel Hanna, MD  
Departments of Internal Medicine and Infectious Disease  
Henry Ford Health System, Detroit, Michigan



## Abstract

Mycobacterium Tuberculosis (MTB) continues to affect millions of people worldwide and remains a significant cause of mortality in those who contract the disease and do not receive proper treatment. Hence, this disease continues to be transmitted as people are frequently not properly isolated. TB is usually divided into two forms: pulmonary and miliary. Predominantly, the focus is on pulmonary TB, but that is only one of many complications of the disease. Miliary TB occurs when the infection hematogenously disseminates throughout the body and causes further complications. When the infection seeds other organ sites, it causes unique complications and one of the more worrisome is peritonitis. We report a case of disseminated mycobacterium tuberculosis infection causing peritonitis in a patient presenting with vague complaints of cough, abdominal pain, ascites, and weight loss. The patients' initial radiologic studies revealed a cavitory lesion in the lung, significant mediastinal, abdominal, and pelvic lymphadenopathy with omental thickening. It was initially thought the patient had a hematologic or gastrointestinal malignancy with diffuse metastases but after bronchoscopy, omental, lymph node biopsies and cultures were performed, it revealed acid-fast bacilli and mycobacterium tuberculosis culture positive infection. The patient was immediately placed in isolation, the health department was contacted, and he was started on directly observed treatment (DOT) with isoniazid, rifampin, ethambutol, and pyrazinamide after results showed his TB infection was susceptible to this regimen. We concluded that we should not assume malignancy in patients with significant lymphadenopathy and those with pertinent risk factors should always be screened for TB to prevent disseminated infection as this has significant mortality if not treated in a timely fashion.

## Introduction

Mycobacterium tuberculosis remains a prominent disease in today's world but resides mostly in African and Asian countries. Inhalation of aerosol droplets of MTB can result in one of four outcomes: immediate clearance, primary active disease, latent infection, or reactivation disease later in life. The bacilli establish disease in the lungs and depending on the host's immunological status determines disease activity. Immunosuppression leads to reactivation of the disease and can easily spread hematogenously, seeding any part of the body leading to miliary TB<sup>1</sup>. A rare complication is when the bacteria seed the gastrointestinal tract, peritoneum, lymph nodes, and solid organs in the abdomen leading to peritonitis. Most commonly this form of the disease spreads hematogenously from miliary TB or latent infection in the lung. Patients develop abdominal ascites, pain, fullness, and more seriously, peritonitis. Patients require immediate initiation of treatment with directly observed therapy (DOT) with Isoniazid, Rifampin, Ethambutol, and Pyrazinamide to help prevent complications such as: bowel obstruction, perforation, and fistula formation<sup>2</sup>. We present a case of a patient presumed to have metastatic malignancy but found to have culture and biopsy proven abdominal tubercular disease disseminated from a primary pulmonary cavitory lesion.

## Hospital Course

A 30 year old Albanian male initially presented to an outside hospital with complaints of cough and fatigue and was diagnosed with community acquired pneumonia after chest x-ray revealed a right middle lobe infiltrate with associated pleural effusion. He was started on azithromycin and ceftriaxone and then underwent a thoracentesis with drainage of 1.7 liters of cloudy fluid. Gram stain and cultures did not reveal a pathogen but his Light's criteria was positive for a para-pneumonic effusion. He was later discharged with oral antibiotics and followed up with his primary care doctor. Upon follow up, the patient was sent for a CT scan of his abdomen and pelvis due to severe abdominal pain which revealed omental thickening, abdominal lymphadenopathy, splenomegaly and ascites concerning for a type of gastrointestinal malignancy. The patient then presented to the hospital again for further workup. He had an initial mild leukocytosis at 12.1 with neutrophilic predominance at 8.1 and lymphocytosis at 2.6. He had a few low grade fevers with T max 38.5°C but otherwise his basic chemistries, hemodynamics, cultures, and workup were unremarkable. GI and Oncology were both consulted and he underwent biopsy of an abdominal lymph node followed by omental biopsy which revealed granulomatous disease and acid fast bacilli respectively.

After the biopsies, the patient developed hypoxia and worsening leukocytosis, hence a CT of the chest was done which revealed pulmonary nodules with a cavitation with associated mediastinal lymphadenopathy. He was started on broad spectrum antibiotics of vancomycin and piperacillin-tazobactam and cultures were re-sent. Pulmonology was consulted and patient was placed in isolation and bronchoscopy with BAL was performed the same day. AFB cultures were positive for acid fast bacilli and mycobacterium tuberculosis consistent with active disseminated MTB disease. Infectious disease was consulted and the patient was immediately placed on DOT with isoniazid, rifampin, ethambutol, and pyrazinamide. The local, state, and TB health departments were contacted and the case was reported. All other therapies were discontinued and patient was eventually discharged while actively being monitored on treatment by the local health department.

## Images

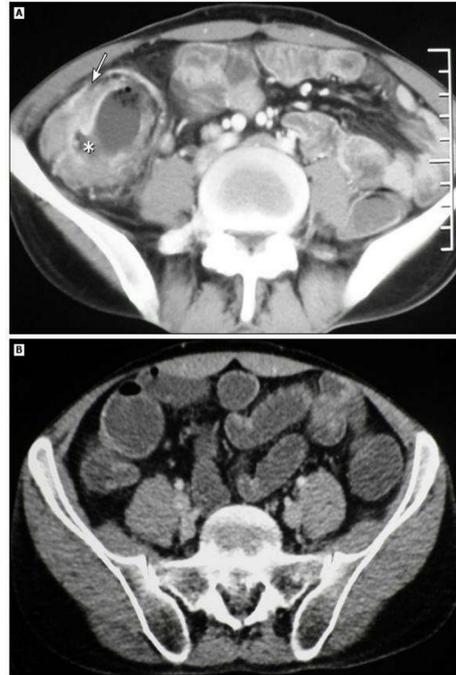


Figure 1. Axial images from contrast-enhanced CT demonstrating (A) ileocecal involvement (arrows) with ulceration (asterisk) and (B) complete resolution of radiographic findings after six months of anti-tuberculous therapy.

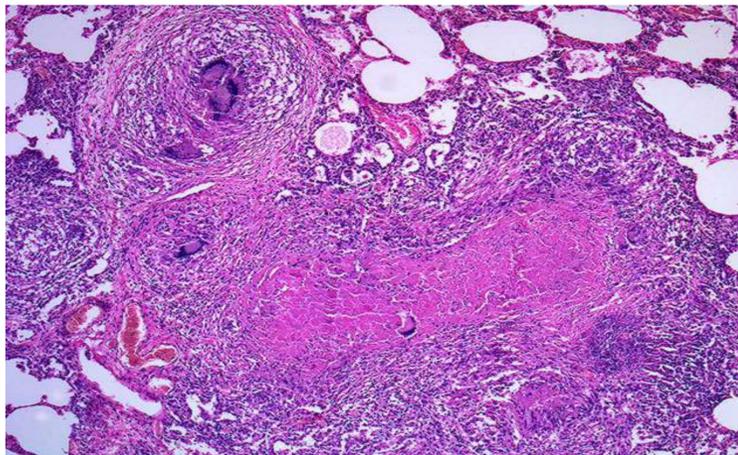


Figure 2. Tuberculous caseating granulomas within the colon

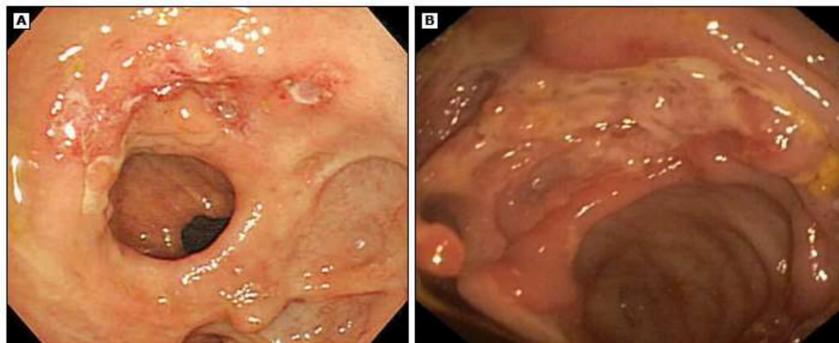


Figure 3. Endoscopic images of intestinal tuberculosis demonstrate a patulous ileocecal valve, scar changes, and multiple ulcers.

## Discussion

Peritoneal tuberculosis is a rare extra-pulmonary site of TB and infection is typically reactivation of latent TB after hematogenous spread from a primary pulmonary TB source. Primary TB is not very common in the United States and peritoneal TB is even more rare. Abdominal ascites and lymphadenopathy has a wide differential including: malignancy, inflammatory, or infectious causes that is impossible to diagnose with imaging alone. Ultimately patients need tissue biopsy as fluid analysis with tuberculosis is not very sensitive (<5%)<sup>3</sup>. The fluid analysis, however, aids in the differential after calculation of the serum-ascites albumin gradient (SAAG), when it is <1.1 than peritoneal tuberculosis is a possibility. Acid fast smears and gene amplification are two other non-invasive means to help aid in diagnosis but again are low in sensitivity when it comes to extra-pulmonary TB. For definite diagnosis of peritoneal tuberculosis, microbiological and/or histological evidence is needed. Direct biopsies of tissue and culture of fluid has proven to be the most sensitive and diagnostic<sup>4</sup>. Once diagnosis is achieved, treatment must be started right away to prevent further dissemination and complications such as peritonitis, bowel obstruction and perforation, or fistula formation. This is achieved with similar treatment of pulmonary TB: two months of the four drug regimen isoniazid, rifampin, ethambutol, and pyrazinamide followed by four months of isoniazid and rifampin<sup>5</sup>. Patients typically respond well with rapid improvement in symptoms and ascites.

Abdominal pain and ascites are the most common presentation and symptoms of this form of extra-pulmonary TB. The tuberculous bacteria seed the peritoneal cavity eventually spreading to the visceral and parietal layers. This then causes a shift in the fluid and ascites develops secondary to exudation of the proteinaceous fluid leading to a low SAAG value of <1.1<sup>3</sup>. Patients later develop constitutional symptoms of fever, weight loss, night sweats, and anorexia, all of which this patient exhibited. Studies have shown that the ileocecal region is affected most by the bacilli due to stasis of fluid in that region as well predominance of lymphoid tissue. The bacteria translocate into the tissue releasing cytokines and initiating an inflammatory cascade leading to bowel complications such as obstruction, perforation, fistula formation, and necrosis with scarring<sup>4</sup>. Fortunately, the patient was lucky to escape serious complications and responded well initially to the four drug regimen. It was concluded that the patient acquired mycobacterium tuberculosis from a relative in Albania where the patient was from and constantly traveled back and forth to visit and supposedly was being treated for MTB.

In summary, not all lymphadenopathy is malignancy and infectious causes must be ruled out, especially when it comes to diagnosing mycobacterium tuberculosis and quickly getting said patients in isolation and on treatment as soon as possible. Taking a good history, review of systems, and physical exam can aid in learning clues about TB risk factors and can help in a quicken the diagnosis and treatment. Once our patients' lymphadenopathy was found, his biopsies and infectious workup was ensued quickly which aided in a diagnosis of peritoneal tuberculosis followed by prompt initiation of the four drug regimen of isoniazid, ethambutol, pyrazinamide, and rifampin. He responded well to therapy and was eventually discharged with monitoring by the public health department. Not only is treatment important in TB, but isolation, exposure history, and notification to the public health department can aid in preventing potential new cases of mycobacterium tuberculosis.

## References

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