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Case Report

A Case of Rapidly Progressive Miliary Tuberculosis with Renal Involvement

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Abstract

Miliary tuberculosis can be a challenging disease to diagnose due to its non-specific symptoms and variation in clinical presentation. Prior reports of miliary tuberculosis show lung manifestations of different shapes and sizes that are often mistaken for other diseases. Here, we have a 64 year-old female who initially presented with non-specific symptoms and a unique respiratory process on diagnostic imaging which progressed to multiple pulmonary nodules within a two week time span. In addition, patient developed acute kidney injury that progressed to acute renal failure requiring hemodialysis and later became hemodialysis-independent after starting anti-tuberculosis medication.

Introduction

Miliary tuberculosis is a potentially life-threatening disease and diagnosis is often delayed due to its varying presentation. During the acute phase, patients can suffer from multi-organ failure, septic shock syndrome or acute respiratory distress syndrome [1]. In the later sub-acute or chronic phase, patients are more likely to present with fever of unknown origin, failure to thrive, and dysfunction in one or more organ systems [1].

Fever, night sweats, and anorexia are the most common presenting symptoms of tuberculosis [1]. Bronchial cultures often do not reveal the causative organism as with this case. Sputum and blood cultures are also commonly negative and a negative tuberculin skin test cannot exclude tuberculosis infection; therefore, obtaining a tissue sample is imperative in diagnosing military tuberculosis [2].

Case Report

Patient is a 64 year-old Chinese women who immigrated to the United States 35 years ago who presented to the ED with progressive fatigue, fever, shortness of breath for the past 2 weeks. She admitted to a decrease in appetite, increased sweating, dyspnea on exertion, lower extremity swelling and multiple bowel movements ranging from 7-8 loose stools per day. She denied any allergies, tobacco use, alcohol use and illicit drug use.

On admission, her O2 saturation was 92% on room air and auscultation revealed bilateral crackles. She denied any wheezing, coughing, hemoptysis, and sputum production. Chest x-ray (Figure 1) and computer tomography (CT) (Figure 2) of the chest revealed bilateral pleural effusion and bilateral lung infiltrate with pulmonary congestion. Broncho-alveolar lavage and blood cultures were negative for any pathologic organisms. Two weeks later, a repeat chest CT revealed multiple pulmonary nodules that are ill-defined and varied in sizes ranging from 1-3cm, with the largest one being 2.7cm by 1.7cm (Figure 3).

Differential diagnosis of multiple pulmonary nodules can include infectious etiologies such as *Haemophilus influenza*, *Mycoplasma pneumonia*, *Mycobacterium tuberculosis*, *Candida albicans* or non-infectious etiologies like sarcoidosis, metastatic carcinoma, lymphoma, amyloidosis, hypersensitivity pneumonitis, and pneumoconiosis.

Concurrent acute renal injury (AKI) necessitated initiation of hemodialysis and prompted a renal biopsy which showed necrotizing granulomatous interstitial nephritis with acid-fast bacilli. A positive direct *M. turberculosis* test confirmed the diagnosis.

Figure 1

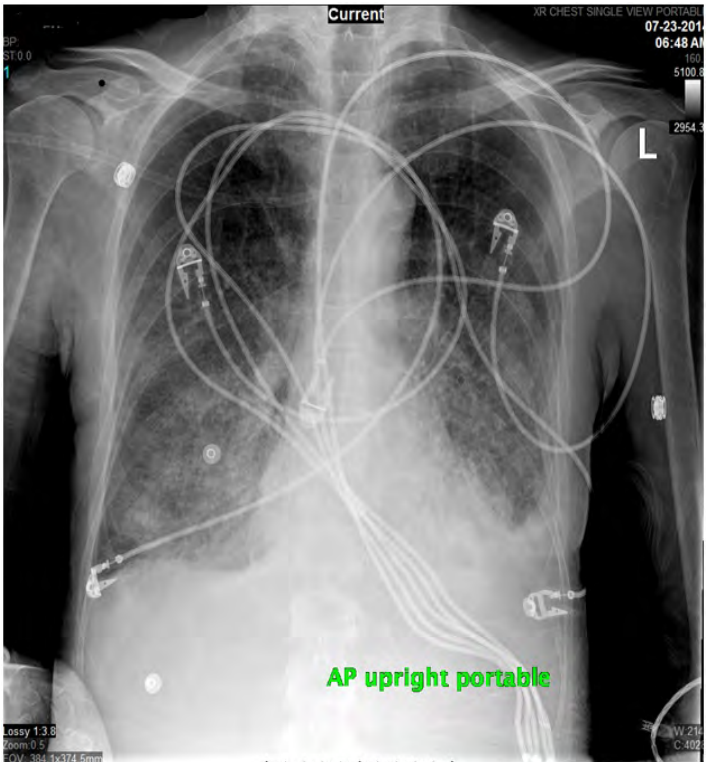


Figure 2

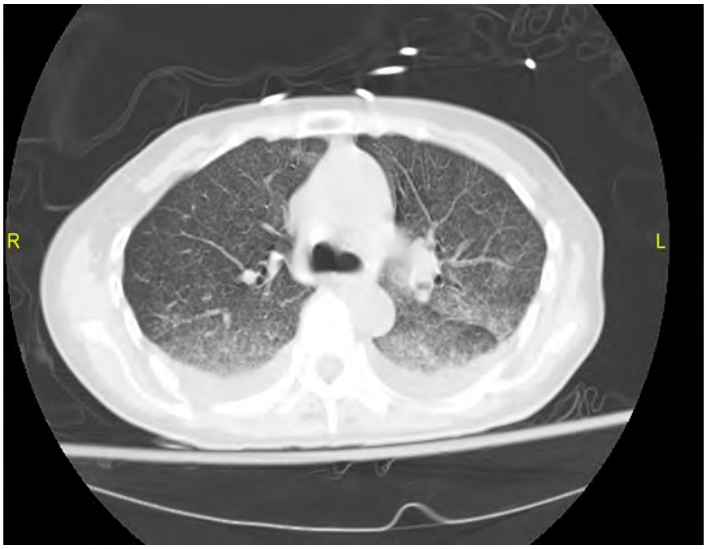
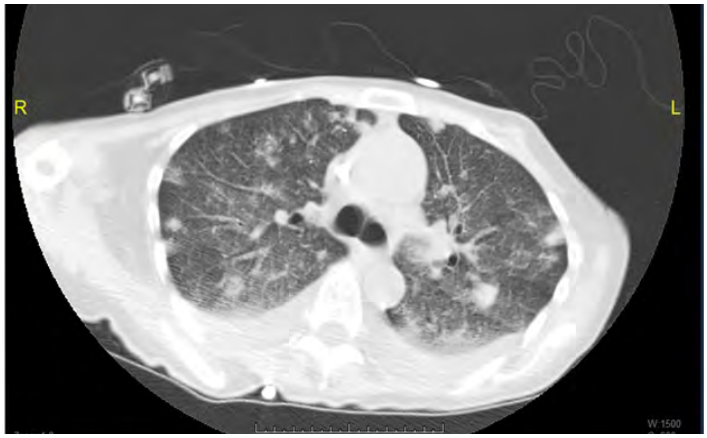


Figure 3



She was started on standard protocol TB therapy (levofloxacin, isoniazid, pyrazinamide, ethambutol) and was discharged home twelve weeks later in stable condition with a diagnosis of miliary TB. Pyrazinamide and Ethambutol was continued for an outpatient course of twelve months. The patient did not require further hemodialysis within 4 weeks of starting anti-tuberculous therapy and the acute kidney injury resolved.

Discussion

Miliary tuberculosis has a variable clinical presentation. The most common presentation of miliary tuberculosis is numerous, randomly distributed, small, well-defined 0.1-0.5 cm nodules which resembles millet seeds; hence, the name miliary tuberculosis [3]. There have been reports of disseminated tuberculosis mimicking lung metastasis and presenting as 2-5 cm well-defined opacities on x-ray [4,5]. Our patient presented similarly with 1-3 cm nodules throughout the lung field. However, our patient's nodules were ill-defined and irregular which varied from previously reported cases. These nodules are much larger than the commonly described nodules of miliary tuberculosis that range 0.1-0.5cm. Miliary tuberculosis, therefore, should be part of the differential diagnosis of multiple pulmonary nodules, especially in patients who traveled to or from endemic countries.

The most unusual part in this patient's case was the rapid progression of our patient's lung nodules that changed on imaging over a two week period. Initial imaging showed bilateral pleural effusion and bilateral lung infiltrate with severe pulmonary congestion and no signs of nodules. In just over two weeks, the patient developed multiple 1-3 cm irregular lung nodules. Current literature that suggests the speed in which tuberculous pulmonary nodules can change in size and number is limited.

Hematogenous spread of the acid-fast bacilli increases the risk of acute kidney injury. Renal involvement is the most common site consisting of 27% of extra-pulmonary involvement due to the large fraction of blood-flow to the kidneys [6,7]. Given that

tuberculosis can be challenging to diagnose, a biopsy of the kidney is often warranted. There have been several reports of renal tuberculosis presenting with a histological picture of interstitial nephritis progressing to acute renal failure [8,9]. Our patient's renal biopsy showed necrotizing granulomatous interstitial nephritis with acid-fast bacilli and her renal function progressively declined. She required hemodialysis until her anti-tuberculosis medications began, and her renal function improved. At this time, literature associated with resolving renal failure post-tuberculosis treatment is sparse at best. The only other remaining case report described a patient similar to ours, diagnosed with renal failure due to renal tuberculosis also with interstitial nephritis, required hemodialysis and was fully treated but remained hemodialysis dependent [9]. Generally speaking however, interstitial nephritis is a reversible disease once the offending agent is removed, and this may have been the case for our patient. Perhaps, the prognosis may be dependent on the histology of the disease, and requires further studies to elucidate the prognosis.

In conclusion, here we present a unique report of miliary tuberculosis with an unusual radiographic appearance and an unusually rapid progression on imaging within a short period of time. A high index of suspicion is essential for the diagnosis of tuberculosis, especially in patients who have migrated from countries that are endemic for disease, even if the migration occurred several decades ago, as reactivation tuberculosis can occur at any point in time, as illustrated in our case report.

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