CLINICAL VIGNETTE

Coccidioidomycosis: A Classic Radiologic Case

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Case

A 53-year-old man with hypertension, diabetes mellitus, and tobacco use presented to the emergency department with two weeks of progressive cough, low-grade fever, fatigue, and shortness of breath. The patient was previously seen by several providers and diagnosed with possible pneumonia based on initial chest x-rays and prescribed antibiotics. Despite completing a full course of antibiotics his symptoms had not improved and may have worsened. Risk factors include smoking one pack per day for fifteen years and outdoor construction work.

The patient appeared mildly ill but was not in acute distress. Vital signs were: temperature 38.1°C, heart rate 96/min, blood pressure 130/85 mmHg, respiratory rate 18/min, with room air oxygen saturation at 94%. Physical exam revealed crackles in bilateral lower lung fields, without signs of consolidation or pleural effusion. The remainder of his physical examination was unremarkable.

He was admitted with concerns of developing pneumonia vs. malignancy. Initial laboratory studies were largely unremarkable, including a complete blood count, liver function and comprehensive metabolic panel. Specifically, the patient's white blood cell count was not elevated, however there was an Eosinophilic predominance. The initial chest X-ray revealed mild bilateral lower-lobe infiltrates with patchy opacities. The right lower lobe showed a well-defined area of consolidation and small effusion (Figure 1). The findings were non-specific but raised concern for a fungal or infectious etiology, particularly given the patient's work history.

CT chest was performed for further evaluation and revealed a number of characteristic findings including: Right lower-lobe consolidation with several well-circumscribed nodular opacities (Figure 2), as well as a right lower lobe cavitary lesion, a hallmark feature of severe coccidioidal pneumonia. Multiple small lymph nodes were noted in the mediastinum, without large hilar lymphadenopathy (Figure 3).

The cavitary lesion in the right lower lobe had a thick, irregular wall with surrounding ground-glass opacities, consistent with a fungal infection. Several smaller nodules from 1–2 cm in size, were scattered in both lower lobes. There was no pleural effusion or pneumothorax. These imaging features were highly suggestive of coccidioidal pneumonia with cavitary formation, a known complication of disseminated disease or severe local infection.

The patient was admitted and treated in the hospital for suspected coccidioidomycosis. He was started on fluconazole for presumed pulmonary coccidioidomycosis.

Confirmatory testing for coccidioidomycosis included serologic assays for coccidioidal IgM and IgG antibodies. IgM antibody test was positive, which confirmed recent exposure to Coccidioides species. He improved with antifungal therapy and was discharged after five days with instructions to continue antifungal treatment for 6–12 months, depending on outpatient follow-up evaluations.[1]

Discussion

Coccidioidomycosis, also known as Valley fever, is a fungal infection caused by the dimorphic fungi Coccidioides immitis and Coccidioides posadasii. It is endemic to arid regions of the southwestern United States, Mexico, and Central and South America. The disease primarily affects the lungs, though it can disseminate to other organs, including the skin, bones, and central nervous system. The infection is acquired through inhalation of spores, which are often released into the air after disturbance of contaminated soil.

The clinical presentation of coccidioidomycosis can vary widely, from asymptomatic infection to severe pulmonary disease. In most patients, the infection presents as a self-limited, flu-like illness with cough, fever, and fatigue. However, some patients, especially those with compromised immune systems, may develop more severe forms of disease, including pneumonia, cavitary lung disease, and widespread dissemination.

Imaging plays a crucial role in the diagnosis and management of coccidioidomycosis. The most common CXR findings are unilateral or bilateral infiltrates, often in the lower lobes. Infiltrates are typically ill-defined and may have a patchy or nodular appearance. Although radiographic findings are nonspecific, they can be suggestive of an infectious etiology, such as bacterial pneumonia, fungal infections, or tuberculosis.

In more severe cases, such as in patients with disseminated disease or immunocompromised states, chest X-ray may show cavitary lesions. Cavitary lesions are more common in patient

with chronic or disseminated coccidioidomycosis. Other findings include nodular opacities, pleural effusions and hilar or mediastinal lymphadenopathy.

CT chest provides more detailed imaging and is often used in patients with suspected coccidioidomycosis who have inconclusive or non-specific chest X-ray findings. Key CT findings include cavitary lesions, characteristic of severe infections and typically described as having thick irregular walls with surrounding ground glass opacities. Other key findings include pulmonary nodules of varying sizes typically bilateral, lower lobe consolidation and hilar or mediastinal lymphadenopathy.[2]

Conclusion

Coccidioidomycosis is an important consideration in patients with respiratory symptoms and a history of travel to or living in endemic areas, especially when imaging suggests pulmonary nodules, consolidation, or cavitary lesions. Early diagnosis in patients with a high imaging suspicion for coccidioidomycosis includes serologic testing and early treatment with antifungal therapy which significantly improves outcomes, particularly in patients with severe disease. Radiological findings are crucial in confirming diagnosis and guiding clinical management.[3]

Figure 1.

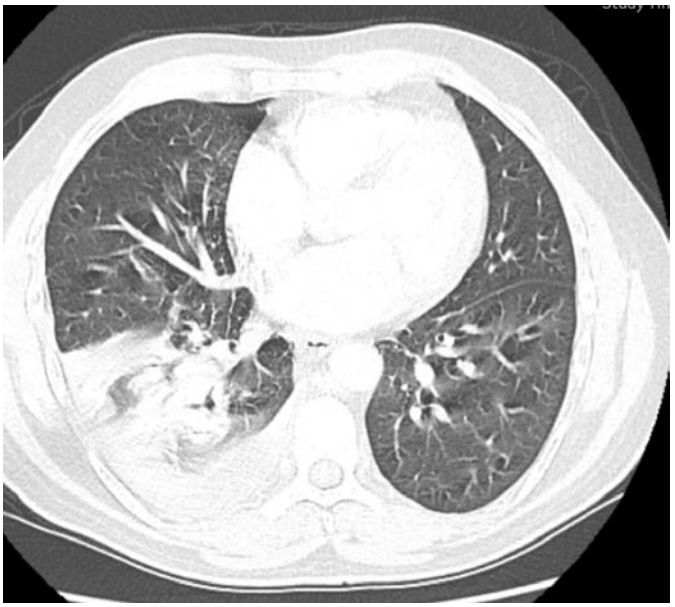

Figure 2

Figure 3

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