

A Rare Case of Charcot-Leyden Crystals In liver biopsy in a 14-Year-Old Boy with Persistent Fever and Miliary Infiltrates

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Abstract

The presence of Charcot-Leyden Crystals in liver biopsy is rare. A report case of a 14-year-old boy who presented with persistent fever and respiratory symptoms. Chest X-ray and CT thorax showed miliary infiltrates. The Mantoux test was positive and sputum for acid-fast bacilli (AFB) was negative. The patient started antitubercular therapy (ATT). There was no response and the patient still had fever. Further evaluation with an ultrasound of the abdomen revealed multiple small liver abscesses with septic emboli in the spleen. Since the patient was non-responsive to antibiotics, biopsy from the lesion in the liver was suggested. Biopsy report revealed Charcot-Leyden crystals with no granulomas. The Patient was diagnosed as a case of systemic parasitic infestation. Albendazole under steroid cover was prescribed and the patient was afebrile on follow-up. It was concluded that the presence of CLCs in a biopsy specimen is rare but may be a cause of an underlying parasitic infestation. Early diagnosis and treatment with antiparasitic drugs can lead to a favorable outcome.

Keywords: Mantoux test; Charcot-Leyden crystals; Liver biopsy; Albendazole.

Introduction

Charcot-Leyden crystals (CLCs) are eosinophil-derived, hexagonal, and birefringent crystals that were first described by Jean-Martin Charcot and Charles-Philippe Robin in 1853 [1]. CLCs are often associated with allergic or parasitic diseases. Their presence in liver abscesses has been reported in only a few cases in the literature, and their significance in parasitic infections is not well understood.

This case report describes a patient with multiple small liver abscesses, septic emboli in the spleen and Charcot-Leyden crystals in the biopsy specimen and discuss the potential implications of these findings in the diagnosis and management of parasitic infections.

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Case presentation

A 14-year-old boy presented to the emergency department with complaints of cough, breathlessness, and fever for 15-20 days. On physical examination, the patient was tachypneic, with oxygen saturation of 94% on room air, and bilateral rhonchi on respiratory examination. The blood workup revealed leukocytosis with normal liver and kidney parameters. The chest X-ray showed miliary infiltrates and CT thorax revealed multiple nodules of varying size with some showing central cavitation with peripheral wedged shaped consolidation. Further workup of sputum for acid-fast bacilli (AFB) and cultures were all negative. The Mantoux test turned out to be positive, and with no other cause evident, the patient was given an anti-tubercular drug (ATD) trial (isoniazid, rifampicin, ethambutol, and pyrazinamide) and was discharged. On follow-up, the patient had minimal response to therapy, with high-grade fever persisting. The patient

was further evaluated with an ultrasound of the abdomen to look for any other source of infection. The USG showed multiple small liver abscesses with septic emboli in the spleen. As the patient had already received antibiotics and had not shown any response, a biopsy from the liver lesion was planned. The patient underwent a USG-guided biopsy of one of the liver lesions. Histological examination of the biopsy specimen revealed many neutrophils, many eosinophils, and Charcot-Leyden crystals, but no granulomas. This clinched the possibility of infective etiology (parasitic infection), which has probably triggered a systemic reaction. ATD was stopped.

The patient was given albendazole (400 mg twice daily) with steroid cover. On follow-up after 14 days of therapy, he was afebrile. The chest X-ray showed improvement within one week (Figure 1) and was normal at the end of therapy.

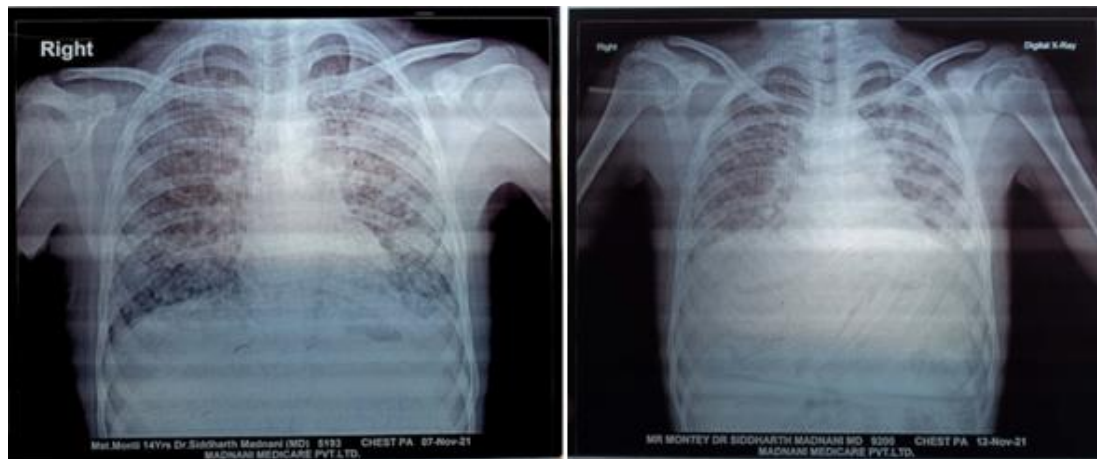


Figure 1: Serial chest x-ray of the patient.

Discussion

Liver abscesses are rare but serious extraintestinal complications of bacterial,

fungal, or parasitic infections, particularly in patients with underlying liver disease or other predisposing factors [2]. The most common parasitic liver abscesses are amoebiasis,

caused by *Entamoeba histolytica* [3], and hydatid disease, caused by the tapeworm *Echinococcus granulosus* [4]. The cases mostly remain subclinical, but they may be symptomatic. A long-standing high eosinophil count is a diagnostic feature [5]. Amoebic liver abscesses typically present with symptoms such as fever, chills, abdominal pain, nausea, and vomiting [6]. Hydatid disease can lead to the formation of multiple cysts in the liver, which can cause symptoms such as abdominal pain, hepatomegaly, and jaundice [7]. When a rare site is involved, the diagnosis is usually made based on imaging studies, such as ultrasonography, computed tomography (CT) scan, or magnetic resonance imaging (MRI) [8]. Imaging studies, laboratory tests, and a thorough medical history are crucial for making an accurate diagnosis. CT scan may represent multiple lesions, which are hypoechoic in the liver with or without hepatomegaly. The biopsy of these lesions shows aggregates of eosinophils, other inflammatory cells, and tissue necrosis. Rarely, Charcot-Leyden crystals (CLCs) with eosinophilic infiltrates are seen in biopsy lesions [9]. The exact pathogenesis of Charcot-Leyden crystals in infections is not well understood, but it has been suggested

that they may result from the breakdown of eosinophils and the release of eosinophilic granules containing major basic protein (MBP). In the above case report, the patient did not respond to ATT, and the biopsy from the liver lesion revealed the presence of CLCs with no granulomas. These observations and the patient's response to albendazole favored a diagnosis of parasitic infection.

Conclusion

This case report highlights the importance of considering parasitic infestations in patients with persistent fever and miliary infiltrates, especially in endemic areas. CLCs with eosinophils are common finding in stool samples of patients with parasitic infection. However, their presence in liver tissue is rare. Their presence in hepatic lesions can be indirect evidence of parasitic infestation. Illness may persist for months leading to more complications. For a favorable outcome, early diagnosis, and treatment with antiparasitic drugs should be considered, especially in developing country like India with high prevalence of parasitic infections. Further studies are needed to elucidate the exact mechanism.

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