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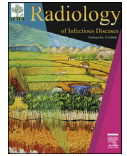


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Case Report

Myelodysplastic syndrome with aspergillus fumigatus infection: A case report and literature review

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Abstract

Although fungi are pervasive in many environments, there are few causing diseases in humans. Its physical and biological characteristics combine to provide an organism that can cause tremendous morbidity and high mortality if left unchecked. Of these, aspergillus fumigatus is particularly well suited to be a pathogen of the human lung. Aspergillus fumigatus often causes a variety of pulmonary syndromes such as allergic bronchopulmonary aspergillosis, chronic pulmonary aspergillosis and invasive pulmonary aspergillosis. Aspergillus fumigatus infection in the liver is rare. Pyogenic liver abscess can be seen in 80% of the patients with liver abscess. Other reasons include parasitic, mixed (bacterial superinfection of parasitic abscess) and uncommonly fungal infections.

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Keywords: Aspergillus fumigatus; Myelodysplastic syndrome; Liver abscess

1. Introduction

Over 1.5 million fungal species have been reported, but only a handful cause diseases in animals. They invade the body through the airway, and of those, only a few can routinely circumvent the barriers and innate immune responses within the human lung [1]. Aspergillus fumigatus can cause a spectrum of pulmonary diseases, which are broadly classified as saprophytic, allergic or invasive [2]. Here we report a case of myelodysplastic syndrome with aspergillus fumigatus infection of the liver. Three scenarios are mentioned for hepatic infection formation: agents may invade the liver through biliary tract and blood system or by direct extension, especially through gallbladder bed. They can occur most frequently in the presence of biliary tract infections. Also hepatobiliary surgery, radiological hepatobiliary procedures, non-biliary intraabdominal

infections (appendicitis or sigmoiditis), diabetes, malignancy, denutrition and immunosuppressive therapy (prior to organ transplantation) are other risk factors [3].

2. Case report

An 18-year-old boy presented to outpatient department with three-month history of reduction of leukocyte and fatigue with no nausea, vomiting, or weight loss on 20 January 2015. He was found to have a hemoglobin of 75 g/L, white blood cells (WBC) of $4.43 \times 10^9/L$, red blood cells (RBC) of $2.40 \times 10^{12}/L$, platelets of $21 \times 10^9/L$ by laboratory examination. The temperature was among 37.5–38 °C. The blood pressure, respiratory rate and pulse were within the normal range. The abnormal routine blood tests raised concerns about blood system diseases. Bone marrow aspiration and biopsy were performed later. The outcome showed myelodysplastic syndrome (MDS). Then the patient was performed hematopoietic stem cell transplantation (Figs. 1 and 2).

One month later, the patient got abdominal pain. Physical examination revealed that his right upper abdominal pain. The

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abdomen was soft without tenderness or distention. The liver and spleen were not palpated. Liver enzymes such as ALT, AST, total bilirubin were normal. Abdominal computed tomography (CT) was performed in our institute and a round hypodense area with well-defined boundary in the right lobe of the liver was showed in CT scanning. After administering intravenous contrast media, the boundary of the lesion was mild enhancement and the lesion was more apparent. This lesion appeared moderately hypointense on T1-weighted MR imaging, while T2-weighted imaging showed a hyperintense lesion. On the diffusion weighted imaging (DWI), the lesion was restricted diffusion. After injection of gadolinium, arterial phase imaging showed slight peripheral enhancement, which was more apparent in the delayed phase. The primary diagnosis was benign lesion. In order to clarify the diagnosis, the lesion was punctured on the guidance of CT and pathological examination demonstrated liver abscess. The microorganisms culture returned positive for aspergillus fumigatus.

A month later, the patient subsequently improved after systemic antifungal therapy.

2. Discussion

In normal exposures, spores of the aspergillus fumigatus are barred by the barriers of sinus turbulence, temperature, mucus, and cilia or eliminated through phagocytic surveillance. Fungal spores are generally cleared quickly and successfully from the lung through innate and mechanical mechanisms. However, in situations where innate barriers fail

to eliminate the fungi, serious diseases can ensue. The current incidence of invasive fungal diseases is a consequence of significant growth of number of immunocompromised patients in recent decades. This is caused by significant burdens of immunosuppressive conditions such as HIV infection, cancer chemotherapy, autoimmune disorders, numerous targeted monoclonal antibody therapies affecting immune responses, prolonged stay in ICU and increasing number of transplant patients. Most reported cases of aspergillus fumigatus infection occur in the lung, but in this case, the lung is well and aspergillus fumigatus infects the liver.

MDS is a constellation of different diseases including anemia, fatigue and bleeding. The decreased white blood cell number and deterioration of immune function are unavoidable in the patients with myelodysplastic syndrome (MDS). About 20% patients die of a wide variety of infections. At present, MDS prognosis is evaluated according to the IPSS-R system, which includes bone marrow morphology, blast counts and five different categories of cytogenetic abnormalities. Improving hemopoiesis, thus eliminating related symptoms is the main therapeutic goal for the great majority of MDS patients. Hematopoietic stem cell transplantation is the only way of curing MDS [4,5].

MDS may cause infection of many organs in the whole illness period. Different kinds of pathogens can gain access to the liver by direct extension from contiguous organs or through rich dual blood supply provided by the portal vein and hepatic artery. The clinical presentation of liver abscess is insidious, and fever with chills and right upper quadrant pain are the most common complaints.

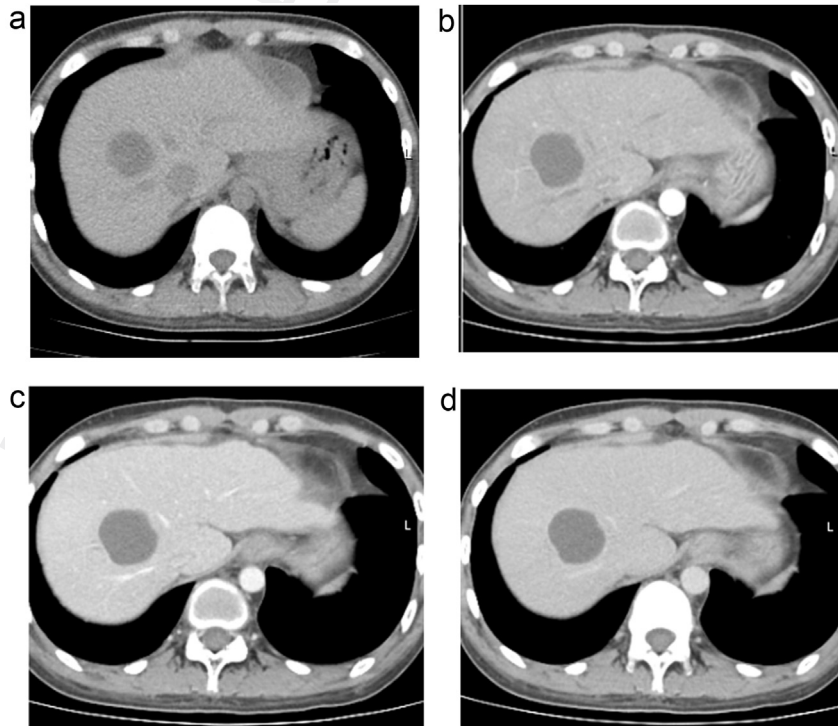


Fig. 1. Abdominal CT showed a round hypodense area with well-defined boundary in the right lobe of the liver (A). After administering intravenous contrast media, the boundary of the lesion was mild enhancement and the lesion was more apparent (B–D).

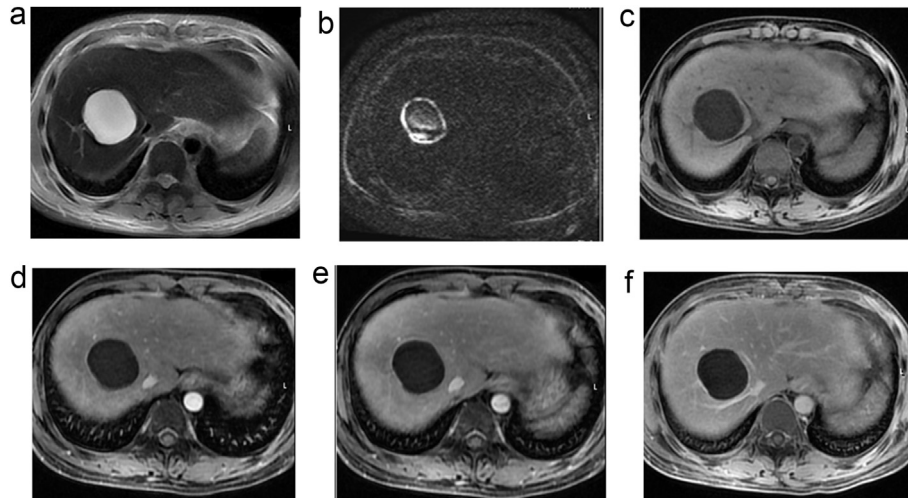


Fig. 2. Abdominal MR showed hypointense on T1WI (C) and hyperintense on T2WI (A). The wall of the abscess is peripherally enhanced (D–F). On the diffusion weighted imaging (DWI) (B), the lesion was restricted diffusion.

Hepatic abscess can be diagnosed through various imaging modalities. CT is the basic diagnostic protocol. Magnetic resonance imaging (MRI) is a noninvasive way to detect the abnormalities in the liver and it has become essential to use MRI for the diagnosis of hepatic abscess. In general, liver abscess is located at the right lobe and are solitary. The center of hepatic abscess often appears as mixed signals with hypointense on T1WI and hyperintense on T2WI. The wall of the abscess is peripherally enhanced. Diffusion weighted imaging (DWI) is a common MRI sequence whose principle is based upon measurements of the random Brownian motion of water molecules within a voxel of tissue and is particularly useful in detecting the characteristics of infection and tumor. Abscess tends to restrict the diffusion of water molecules, resulting in a hyperintense appearance [6]. The treatment of liver abscess is due to its size. Percutaneous drainage is required for large abscess (>5 cm in size) and less than 5 cm in diameter, can be treated with 4–6 weeks of antibiotic therapy referring to the sensitivity of the microorganism [3].

In conclusion, the symptoms of liver abscess are nonspecific and insidious, especially the *aspergillus fumigatus* infection, and the diagnosis needs an extremely clinical suspicion and various imaging modalities. The final diagnosis is often based on puncture and aspirate culture.

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