Pleural Empyema Secondary to Rupture of Amoebic Liver Abscess

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Abstract

Amoebiasis is a worldwide parasitic infection although it is more prevalent in the subtropical and tropical countries. Extraintestinal amoebic infections currently have been reported in increased numbers of male homosexuals and immunocompromised patients. Here, we present an interesting case of a 27-year-old homosexual man with pleural empyema secondary to rupture of amoebic liver abscess. Using chest tube and percutaneous liver abscess drainage, the patient was treated with metronidazole followed by iodoquinol. His general condition improved dramatically. After one-year of follow-up, there was no evidence of relapse on plain chest radiography and abdominal CT scan.

Key words: amoebiasis, pleural empyema, liver abscess


Introduction

Amoebiasis is a common cause of recurrent diarrhea, bloody mucoid stool and infrequently liver abscess. It occasionally presents as hepatopulmonary fistula, pleural empyema or cardiac tamponade when it involves the cardiopulmonary systems (i.e., invasive amoebiasis) (1). Recently, invasive amoebic infections have been reported in increased numbers of male homosexuals and immunocompromised patients (2, 3). Here, we present a 27-year-old homosexual man with pleural empyema secondary to rupture of amoebic liver abscess. With chest tube and percutaneous liver abscess drainage, the patient was treated with metronidazole followed by iodoquinol. His general condition improved dramatically, and he had no evidence of relapse during extensive follow-up.

Case Report

A 27-year-old homosexual man was admitted to our hospital with dyspnea and right upper quadrant abdominal pain. There was no recent travel history or exposure to animals, and no recent contact with sick people. He had neither fever nor watery diarrhea. Plain chest radiography showed opacity over the right hemithorax (Fig. 1A). Ultrasonic echogram and CT scan of the thorax and abdomen revealed right-sided massive pleural effusion (Fig. 2A, 4A) and a solitary large liver abscess (around 10×8 cm) at the right hepatic lobe (Fig. 2B, 4A). Using chest tube drainage, a large amount (around 1,500 mL) of chocolate-colored pleural effusion was drained out. After that, follow-up chest radiography showed free air formation over the right upper quadrant of the abdomen (Fig. 1B). Also, CT scan of the abdomen displayed air-fluid level with a decreased volume of liver abscess (Fig. 2D). Thus a communication (e.g., hepatopleural fistula) between pleural space and liver abscess was suggested. CT-guided percutaneous catheter drainage of the liver abscess was performed because of the large abscess with impending rupture. Cultures of pleural effusion and liver abscess for aerobes, anaerobes, acid-fast bacilli and fungi were negative. Specific stains for bacteria, acid-fast bacilli and fungi were also negative. Serology test of anti-amoebic antibody (indirect hemagglutination test, IHA) was strongly positive (1: 65536). His serum HIV test was negative. The diagnosis was amoebic liver abscess with rupture into the pleural space, an important pleuropulmonary complication on invasive amoebiasis.
Colonoscopy revealed no evidence of primary intestinal lesions. Also, six sets of stool examinations showed no cysts or trophozoites of *Entamoeba histolytica*. With chest tube and percutaneous liver abscess drainage, the patient was treated with metronidazole (500 mg intravenously thrice-daily for 21 days) followed by iodoquinol (a luminal amoebicide, 650 mg orally thrice-daily for 20 days). His general condition improved dramatically. Three weeks later, follow-up plain chest radiography showed improved right-sided pulmonary status (Fig. 1C). Also, CT scan of the thorax and abdomen revealed residual pleural effusion and liver abscess (Fig. 3A, 3B, 4B). The patient was discharged four weeks after admission. After one year of follow-up, there had been no evidence of relapse on plain chest radiography (Fig. 1D) and CT scan (Fig. 3C, 3D, 4C).

**Discussion**

Infection with *Entamoeba histolytica* occurs worldwide but is more prevalent in the subtropical and tropical countries (4). Low socioeconomic conditions, malnutrition and chronic alcoholism are contributing factors to the development of amoebiasis. The primary *E. histolytica* infection results in acute amoebic colitis, which is mostly benign. Other tissue infection is almost secondary to colic amoebiasis. Liver abscess is the most common extraintestinal complication. It is due to embolization of *E. histolytica* inside the liver through the portal vein, leading to focal necrosis and then an abscess. Pleuropulmonary complications (i.e., thoracic amoebiasis) are the second most frequent tissue complication, often associated with liver abscesses. They manifest in pleural effusion, lung abscess and, rarely, pleural empyema (5). The theoretical mechanisms of thoracic amoebiasis are as follows (5, 6): First, the infection usually spreads to the lung by direct rupture of an amoebic liver abscess through the diaphragm. Second, the infection may disseminate to the thorax directly from the primary intestinal lesion through hematogenous or lymphatic spread. Finally, inhalation of dust containing cysts of *E. histolytica* is also a hypothetical route. In the present patient, amoebiasis extended to the thorax by perforation of a liver abscess through the diaphragm and into the pleural space, resulting in pleural empyema.

Patients with thoracic amoebiasis usually develop fever and right upper quadrant abdominal pain that is referred to the tip of the right shoulder or in between the scapula. Hemoptysis is also a common symptom. Thoracic amoebiasis could be suggested by the following presentation, e.g., an
Figure 2. (A) and (B) CT scan of the thorax and abdomen shows right-sided massive pleural effusion with collapse of most of the right lung (Panel A) and a solitary large liver abscess (~10x8 cm) at the right hepatic lobe (Panel B). (C) and (D) After placement of chest tube (Panel C), CT scan shows air-fluid level with a decreased volume of liver abscess and right subcutaneous emphysema (Panel D).

Figure 3. (A) and (B) One week before discharge, CT scan of the thorax and abdomen shows markedly less right-sided pleural effusion (Panel A) and a residual liver abscess (arrow) (note percutaneous drainage catheter is still in place) (Panel B). (C) and (D) After one year of follow-up, CT scan shows normal lung fields (Panel C) and liver (Panel D).
A diagnosis of thoracic amoebiasis by finding E. histolytica in stool specimens is of limited value. In a limited number of cases, amoebae might be found in aspirated pus or expectorated sputum. Liver enzymes are usually normal and neutrophilic leukocytosis may or may not be found. Serology tests are of immense value in diagnosis. Anti-amoebic antibody can be detected by IHA (in our patient) or enzyme-linked immunosorbent assay (ELISA). Amoebic antigen can be detected from serum and pus by ELISA (1). Recently, the detection of E. histolytica DNA in urine or saliva provides a new approach for the diagnosis of amoebiasis (7, 8).

Pleuropulmonary amoebiasis is easily confused with other illnesses, and it is treated as pulmonary TB, bacterial lung abscess, and carcinoma of the lung. Aspiration and drainage of pus from thoracic empyema may be needed for confirmation and therapeutic purposes. Also, amoebic liver abscess has been recommended to be treated with metronidazole or tinidazole plus a luminal amoebicide (eg., iodoquinol) even if intestinal infection is not documented (9, 10). Metronidazole can be used intravenously when necessary. Percutaneous needle aspiration or catheter drainage may be helpful for large abscess (over 5-10 cm), in particular if the diagnosis is uncertain, if there is an initial lack of response, or if a patient is very ill, suggesting impending abscess rupture (e.g., in our patient).

Currently, amoebic infections have been reported in increased numbers of male homosexuals and immunocompromised patients (2, 3). This is an evident case of pleural empyema secondary to rupture of amoebic liver abscess. Amoebic empyema should be considered in the differential diagnosis of right-sided pleural effusion along with liver abscess, especially in male homosexuals. The existence of hepatopleural fistula should be suspected when free air appears in the right upper quadrant of the abdomen after placement of a chest tube in patients with empyema.

The authors state that they have no Conflict of Interest (COI).

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References