

## Pyogenic liver abscesses in a child spreading to pulmonary and subcutaneous tissues: case report

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Pyogenic liver abscess is a rare and life-threatening disease in children. Our case is noteworthy because of the rapid advancement of liver abscesses without any other systemic disorder. A 16-year-old girl was admitted to the hospital with fatigue, pallor, weight loss and high fever. In physical examination a fluctuating mass was observed under the scapular area and hepatosplenomegaly was found. In computed tomography, three septated cystic lesions which looked like abscesses were demonstrated in the liver. The abscess was drained through percutaneous route. Right pleural empyema with clinical features of adult respiratory distress syndrome appeared after the first day of treatment. *Bacteroides* sp. was isolated from pus. On the twentieth day of the therapy, control abdominal computed tomography revealed two new abscesses in the liver. They were drained and the antibiotic therapy was continued with ticarcillin-clavulanate, fluconazole and levofloxacin. By the end of the first week of the therapy, the fever of the patient had abated. This therapy was continued for four weeks; 15 days after the end of the therapy there was prominent healing of the liver lesions with only one necrotic remnant 2 cm in diameter on abdominal computed tomography.

*Key words:* pyogenic liver abscess, child, empyema.

Pyogenic liver abscess (PLA) is a life-threatening disease in children that requires prompt diagnosis and therapy<sup>1,2</sup>. PLA is an extremely rare condition among immunocompetent children. The overall incidence has varied from 25.0 and 78.9 per 100,000 pediatric admissions in different studies<sup>3,4</sup>. Since the clinical symptoms of patients are nonspecific, many patients have been diagnosed by mere suspicion of the disease<sup>1</sup>. In recent years, the diagnosis and treatment of PLA have advanced in parallel to the developments in imaging modalities. The reason for presenting our case is the rapid advancement of liver abscesses without any other systemic disorder.

### Case Report

A 16-year-old girl was admitted to the hospital with fatigue, pallor and weight loss of three months' duration; high fever was an additional complaint during the last month. Her weight was below the fifth percentile. A fluctuating and

protruded mass was observed under the scapular area. Respiratory distress was present and respiratory sounds were decreased over the right hemithorax. Liver and spleen were palpated 7 and 4 cm under the costal margin on midclavicular line, respectively. In abdominal ultrasonography (US) and computed tomography (CT), three septated cystic lesions resembling abscesses were demonstrated in the liver (Figs. 1a, b). Her hemoglobin was 9.8 g/dl, mean corpuscular volume 74.8 fl, and white blood cell count 11,200/mm<sup>3</sup>. Blood smear examination revealed 70% band form, 12% neutrophils and 18% lymphocytes. Erythrocyte sedimentation rate was 114 mm/h. Prothrombin time, activated partial thromboplastin time, serum transaminases and bilirubin levels were normal; serum albumin level was low (2.4 g/dl). The serologic tests for human immunodeficiency virus, hepatotropic viruses and hydatid cyst were negative. Bone marrow examination was compatible with inflammation;

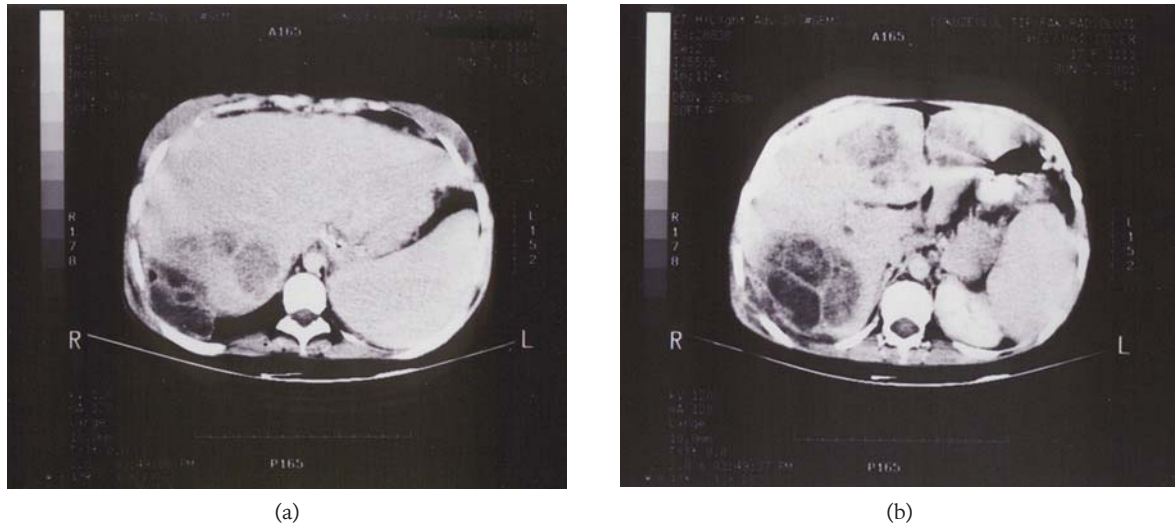


Fig. 1. Transverse CT scans at the level of the upper liver (a) and lower liver (b) show right posterior lobe hypodense multiloculated abscess cavity, extending to thorax and to the thoracic wall. There are hypodense abscess lesions in the right anterior and left lobe of the liver as well.

atypical cells were not seen. The abscess, protruded under the right scapula, was drained through percutaneous route and the material was sent to laboratory for culture. In addition to drainage, first antibiotic therapy including meropenem, amikacin, vancomycin and metronidazole was started empirically. Unfortunately, right pleural empyema and left lower lobe consolidation (Fig. 2) with clinical features of adult respiratory distress syndrome (ARDS) appeared after the first day of treatment. Since it was impossible to reach the other abscesses in liver and spleen through

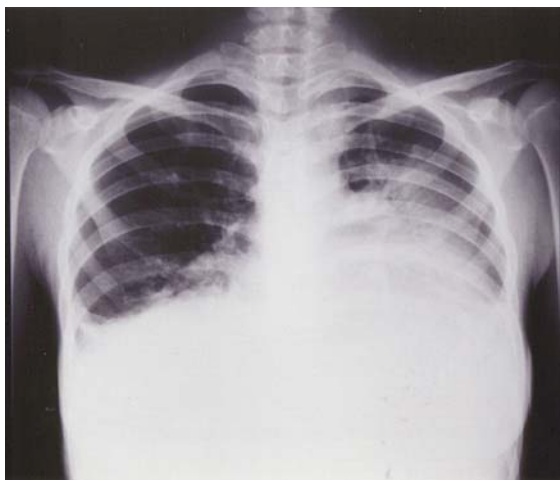


Fig. 2. Chest X-ray demonstrates right pleural empyema and left lower lobe consolidation.

percutaneous route, three big abscesses and multiple microabscesses (ranging from 3 to 8 cm and 2 to 10 mm in diameter, respectively) were drained in the operation. One of the abscesses ruptured to the subcutaneous tissue and pleural space causing pneumothorax and necessitating tube drainage of pleural space. *Bacteroides* sp. was isolated from pus; however, all blood cultures were negative. Tests for parasites, fungi, *Yersinia* and *Mycobacterium tuberculosis* were negative. No abscess was detected in thorax and brain in the scans. The patient was supported with mechanical ventilation for ARDS for a 15-day period. Echocardiography, double-contrast barium enema of colon, fecal alpha 1-antitrypsin level, gynecological examination, serum immunoglobulin levels, nitroblue tetrazolium test and flow cytometry were performed after extubation and all were normal. On the twentieth day of the first antibiotic therapy, control abdominal CT, performed because of the continuation of her complaints, i.e. high fever and abdominal pain, revealed two new abscesses in the liver. These two abscesses were drained by percutaneous needle aspiration and the antibiotic therapy was continued with ticarcillin-clavulanate, fluconazole and levofloxacin. On the fourteenth day of the second therapy, the patient was operated because of three new liver abscesses detected in abdominal CT. In the operation these abscesses, which arose as necrotic areas, were drained. It was noted that all the microabscesses detected in the previous

operation had disappeared and other intraabdominal organs were normal. By the end of the first week of the second antibiotic therapy, fever of the patient had decreased. This therapy was continued for four weeks; 15 days after the end of the therapy there was prominent healing of the liver lesions with only one necrotic remnant 2 cm in diameter in abdominal CT (Fig. 3).



Fig. 3. Transverse CT scan of the liver shows prominent healing of the liver lesions.

### Discussion

Pyogenic liver abscess is an extremely rare condition among children without immunodeficiency. The results of the investigations related to immune system disorders were normal in our patient. In addition, she had no previous history of recurrent infections. Many patients with PLA have admitted to hospital with nonspecific complaints such as fever, fatigue and abdominal pain<sup>5</sup>. These findings alone can be a reason for admission to the hospital. Likewise, the presenting complaints of our patient were fever, fatigue and weight loss.

Systemic bacteremia is thought to be the most common cause of liver abscesses in the childhood period<sup>6</sup>. The lesions are typically distributed in both lobes of the liver as multiple microabscesses<sup>6</sup>. It is known that the microorganisms can be isolated in abscess material culture (81%) more than in blood culture (50%)<sup>5</sup>. Blood cultures were obtained from our patient several times and all were negative. We were able to isolate the microorganism only in abscess material of our patient. Moreover, no

other abscess or infectious origin was detected. To rule out endocarditis, echocardiography was performed. No abscess was seen in brain and thorax in CT scans.

Portal bacteremia is responsible for up to 17% of cases<sup>6</sup>. Diverticulitis, peritonitis, omphalitis, pancreatitis, inflammatory bowel disease and postoperative abdominal infections cause PLA via portal venous drainage<sup>6</sup>. Such abscesses are usually large, occur mainly in the right lobe, and may be single or multiple. In laparotomy of our patient, no intraabdominal infection was detected and the pathological examination of the appendix was normal. Inflammatory bowel disease and pelvic inflammatory disease were excluded with further investigations. The primary cause of the pyogenic liver abscess in our patient could not be identified. The literature states the incidence of cryptogenic abscesses as between 9-42% of total etiologies<sup>1,2,7</sup>.

Presence of shock, ARDS, disseminated intravascular coagulation, hypoalbuminemia and clinical jaundice are emphasized as poor prognostic criteria<sup>7</sup>. Early diagnosis and treatment before the development of these complications may reduce the mortality rate. Acute respiratory failure is a rare but severe complication of liver abscesses<sup>7</sup>. Patients with multiple abscesses have higher incidence of this complication than those with single abscess<sup>2</sup>. When our patient was hospitalized, her serum albumin level was low, and after the first day of treatment, ARDS developed. Albumin infusion was performed several times, and the patient was supported with mechanical ventilation for respiratory distress and low oxygen saturation.

Radiological examinations are required to make the diagnosis. Ultrasonography and CT have 80% and 97% sensitivity in detection of liver abscesses, respectively<sup>8</sup>. In addition, radiological imaging methods are important for detection of the localization of the lesions before drainage<sup>3</sup>. Diffuse abnormalities of the liver, especially fatty infiltration, may reduce the sensitivity of US<sup>5</sup>. The abscesses in CT are seen as hypodense lesions<sup>3</sup>. In our patient, many hypodense lesions suggesting abscess formation were seen. Some areas in the course of healing remained after drainage of these abscesses.

In conclusion, PLA should be suspected in any child with unexplained, persistent fever and nonspecific symptoms. In patients with PLA,

drainage to pleural space and respiratory distress may occur. Therefore, treatment should be started as soon as possible after removal of the pus by drainage and detailed investigations for underlying diseases should be performed in patients with PLA.

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