Case Report: Acute Abdomen Caused by Brucellar Hepatic Abscess

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Abstract. Brucellosis, a zoonosis that is common worldwide, is endemic in many countries, primarily those of the Mediterranean region (including Turkey). Human brucellosis is a systemic infection with a wide clinical spectrum. Although hepatic involvement is very common during the course of chronic brucellosis, hepatic abscess is a very rare complication of *Brucella* spp. infection. We present a case of hepatic abscess caused by *Brucella melitensis*, which resembled the clinical presentation of surgical acute abdomen.

INTRODUCTION

Brucellosis is the most common zoonosis worldwide, caused by microorganisms of the genus *Brucella*, an intracellular bacteria that widely affects animals and can cause systemic infections in human with an acute, subacute, or chronic course.¹ The disease remains endemic in many countries, mainly in the Mediterranean basin, the Middle East, India, Mexico, Central and South America, and, currently, central and southwest Asia. An increase in the annual number of cases reported has been also observed in Turkey, exceeding 262.2 cases per million.²

The most common sites of localization are osteoarticular and genitourinary systems. The other less common complications affect cardiovascular, respiratory, gastrointestinal, and central nervous systems.³ Although hepatic involvement is common in the form of hepatomegaly, cholestasis, and hypertransaminasemia and histological findings are consistent with diffuse hepatitis or granulomas,⁴ hepatic abscesses and cholecystitis are rare complications in brucellosis.⁵ We present a case of hepatic abscess caused by *Brucella melitensis*, which had the clinical presentation of surgical acute abdomen.

CASE

A 40-year-old Turkish convict male was transferred from a regional prison in southern Turkey and admitted in our hospital with a week's history of fever up to 40.1°C, rigors, night sweats, and upper right quadrant abdominal pain for 4 days. The patient also reported the presence, for the past few weeks, of slight evening fever associated with sweating, but he was brought to the hospital from the prison because of increasing abdominal pain. He had previously been in good health.

On admission, his vital signs were as follows: body temperature 38.4°C, arterial blood pressure 130/70 mmHg and heart rate 90/minute, and respiration rate 14/minute. Physical examination revealed moderate abdominal guarding and rebound tenderness in the right upper quadrant. The respiratory, neurologic, and musculoskeletal systems were found to be normal. No adenopathies were found on palpation. The symptoms of peritoneal irritation in the right upper quadrant of the abdomen clinically suggested a surgical acute abdomen.

Laboratory tests showed hemoglobin 13.8 g/dL, hematocrit 43.1%, and white blood cell count 14,400/mm³ with 75% polymorphs, 16% lymphocytes, 1% eosinophils, and 8% monocytes. The platelet count was 411,000/L. Erythrocyte sedimentation rate was 17 mm in the first hour and prothrombin time, partial thromboplastin time, and D-dimers were within normal limits, as were renal function tests, sodium, potassium, total proteins, and albumin. Liver biochemistry revealed increased aminotransferases (alanine aminotransferase: 124 IU/L [0–45], aspartate aminotransferase: 121 IU/L [0–35], gamma-glutamyl transferase: 94 IU/L [0–55], and total bilirubin 0.4 mg/dL (0.3–1.2). C-reactive protein (CRP) was elevated (94 mg/L [0–1]). Urine sediment test, chest X-ray, and electrocardiogram were normal.

Abdominal ultrasonography (US) showed a 55 × 62-mm multiloculated heterogeneous hypoechogenic lesion in the segment 4 of the liver. No other abnormalities were observed in the rest of the liver or in the spleen, gallbladder, pancreas, or kidneys.

Abdominal computed tomography (CT) confirmed the presence of a hepatic cystic lesion with a mean density of 22 Hounsfield unit extending beyond the subcapsular level, multiloculated with septates and a 12 × 15-mm calcification at the center of the lesion (Figure 1).

Although clinical findings suggested an acute abdomen that may require surgical intervention, the patient's imaging findings were consistent with hepatic abscess. Serology for *Echinococcus granulosus* and *Entamoeba histolytica* were negative. Antibiotic therapy with metronidazole and ceftriaxone was started empirically.

Percutaneous needle aspiration under US guidance was performed on hospital day 2, and purulent material was found in aspiration of the abscess. Few leukocytes and gram-negative coccobacilli were seen on Gram stained smears of the aspiration fluid. The specimen was inoculated into an aerobic BACTEC 9240 Peds Plus bottle (Organon Teknika Corp., Durham, NC), which continuously monitor the CO₂ release of potentially growing microorganisms. Detection of positive bottles within a 1-week incubation period was followed by performance of a Gram stain and subculture of the broth in sheep blood agar and chocolate agar. *Brucella* was identified by the detection of gram-negative coccobacilli on subcultures of bacteria, while the Wright's seroagglutination test value was positive at 1:1,280. Identification of *B. melitensis* was made using biochemical tests and agglutination with specific antiserum.

The patient had no direct contact with animals, but he gave a history of ingesting unpasteurized dairy products. Antibiotic

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FIGURE 1. Abdominal computed tomography (CT) imaging shows hepatic *Brucella* abscess (black arrow).

therapy was replaced by rifampicin (900 mg/day), ciprofloxacin (1,000 mg/day), and doxycycline (200 mg/day). On the third day of that regimen, the clinical condition of the patient gradually improved and CRP level decreased to 14 mg/dL. Blood and urine cultures were sterile. Antibiotic therapy was continued for 8 weeks. A follow-up abdominal US at the first month after the therapy showed major regression of the hepatic abscess (the hypoechoic lesion 25 × 13 mm in diameter). The patient was followed up for 4 months after diagnosis, showing clinical stability.

DISCUSSION

Brucellosis is a systemic infection with nonspecific clinical manifestations in any organ or system. Brucellosis-related hepatic abscess, which is remarkably rare, has an incidence of 0.2 per 100 cases of adult patients.⁶ In the past 10 years, the increasing incidence of this pathology is probably a result of increased chances of diagnosis because of advanced diagnostic methods and better access to medical care. Barutta and others reviewed 41 cases (21 were reported between January 1904 and December 2001 and 20 were reported between January 2002 and May 2013) including clinical, laboratory, radiological, and therapeutic patterns. The geographical distribution of hepatic brucellosis corresponds to brucellosis distribution, with 34 cases reported in the Mediterranean (14 in France, 13 in Spain, three in Greece, two in Turkey, one in Italy, and one in Morocco), four cases reported in the United States, one case in Argentina, and two cases in Asia (China and Korea).⁷

Infection occurs through direct or indirect contact with the primary source (the animal) via the skin or mucous membrane or ingestion of contaminated products, especially fresh dairy products.^{7,8} Human brucellosis can have a variety of clinical manifestations, and the diagnosis may be easily missed unless the clinician is aware of a history of raw milk ingestion, exposure to animals, or travel to an area in which the disease is enzootic.⁹ Our patient had a history of consuming unpasteurized cheese product.

Acute illness develops in half of patients infected with *Brucella* spp.; the first symptoms typically appear 1–2 months after infection. Untreated patients or those who receive inade-

quate treatment can develop chronic infections. Most of the clinical signs and symptoms of hepatic brucellosis are nonspecific and overlap with brucellosis, that is, fever that typically lasts more than 1–2 months (with an undulating pattern), sweating and chills, malaise, asthenia, arthromyalgia, hyporexia, weight loss, and spontaneous upper abdominal pain (generally localized in the right hypochondrium) with insidious onset. Laboratory findings usually show increases in inflammatory indexes, increased cholestasis markers, and less often, increased aminotransferases.⁷

The diagnosis can be established according to the isolation of *Brucella* spp. in blood or any other body fluid or tissue sample, or the presence of a compatible clinical picture together with the demonstration of specific antibodies at significant titers or seroconversion.⁸

US and CT are sensitive methods for diagnosing hepatic abscesses.¹⁰ There are several characteristic imaging features of brucellar hepatic abscesses.¹¹ They show a pseudotumoral lesion, more often single, hypoechoic, hypodense, and heterogeneous, and in its center, a single or multiple calcium deposits.⁷ On abdominal US, brucellar hepatic abscesses are usually revealed as single lesions that vary in size from 3 to 10 cm in the right hepatic lobe. In our patient, we identified a single hepatic abscess nearly 55 × 62 mm multiloculated heterogeneous hypoechoic lesion in the segment 4 of the liver.

We conclude that hepatic brucellosis is a pathological feature that is rarely seen in clinical practice. Presentation of a brucellar hepatic abscess as an acute abdominal pathology is also rare. Therefore, the most appropriate therapeutic approach is unclear.¹² Large abscesses are unlikely to respond to medical therapy alone without drainage, either percutaneous or surgical. The combined treatment consisting of percutaneous drainage and systemic antibiotics therapy is safe and effective in patients with a pyogenic liver abscess.¹³ Although treatment with streptomycin, doxycycline, rifampicin, and other antibiotic combinations has been reported, a definite protocol has not been recommended.⁷ We did not perform antibiotic susceptibility tests. Although quinolones were found to have in vitro activity against *B. melitensis* isolates in other studies from our country,¹⁴ the potential toxicity of aminoglycoside therapy is time dependent, in the case we reviewed, rifampicin, ciprofloxacin, and doxycycline combination were preferred. The response to that treatment was favorable, and he recovered quickly. The most appropriate duration of antibiotic therapy for patients receiving conservative management of hepatic brucellosis is not well established, but it seems reasonable to prolong therapy for several months. Our patient was treated with percutaneous drainage and antibiotics therapy for 2 months. The response to that treatment was favorable.

According to our case, we suggest initial percutaneous drainage of the large, solitary hepatic abscess to confirm the causative agent as *B. melitensis* combined with antibiotic therapy to shorten the recovery period of the patient. Surgical drainage should be reserved for non-responding patients in whom percutaneous drainage has failed.

Received January 30, 2015. Accepted for publication September 25, 2015.

Published online November 2, 2015.

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