Description of a rare case of splenic abscess due to spontaneous E. coli bacteremia in a cirrhotic patient

B. CACOPARDO, M. SAPIENZA*, S. LI VOLSI*, M. GUSSIO, P. BENENATI*, C. NOTARARRIGO*, S. MAIUZZO*

Section of Infectious Diseases, Department of Internal Medicine and Medical Specialties, University of Catania (Italy)
*“San Felice” Unit of Infectious Diseases, Basilotta Hospital Nicosia (AUSL 4 Enna) (Italy)

Abstract. – We report on a rare case of splenic abscess due to spontaneous Escherichia coli bacteremia in a 49-year-old cirrhotic. No other source potentially responsible for bacteremia was found through careful diagnostic research. Splenic abscess appeared from ultrasonography and computerized tomography as a 6-7 cm lesion located at the lower splenic pole. Blood cultures allowed to isolate E. coli which, on the basis of antibiotic susceptibility, was treated by a 21-day intravenous cetazidime course at a dose of 6 g/day. The isolated E. coli strain resulted as quinolone-resistant. Disappearance either of high fever or of abscessual splenic lesion was achieved without surgery after the antibiotic round. Spontaneous bacteremia may occur in cirrhotic patients due to intestinal bacteria traslocation from gut lumen to blood. Nevertheless, isolated splenic localization is a very rare event.

Key Words: Escherichia coli; Splenic abscess; Liver cirrhosis.

Introduction

Splenic abscess is a rare clinical event. Its frequency in autopsy series ranges between 01% and 07%1. Currently it remains a subject of case reports and of small institutional series. Usually, splenic abscess occurs as a consequence of systemic bacteremia due to infective endocarditis or as a secondary infection in a spleen damaged by traumas1,2 or infarctions1. Patients with underlying diseases are more prone to splenic abscess formation. Beta thalassemia3, diabetes2, myeloproliferative disorders4,5 and liver cirrhosis1 are well known predisposing comorbidities for splenic abscess formation.

Obviously, these underlying conditions may also influence the number and the size of abscessual lesions, the microorganisms’ spectrum and the definitive prognosis.

Liver cirrhosis may favour spontaneous bacteremia by Gram negative bacteria. In the present report we describe an unusual case of splenic abscess in a cirrhotic patient without any evident source for infection, presumably associated with spontaneous Escherichia coli (E. coli) bacteremia.

Case Report

A 49-year-old male patient was admitted to our Department with a 10-day history of nausea, vomiting, abdominal pain and intermittent fever with chills. Past clinical history revealed an established diagnosis of Child B liver cirrhosis due to ethylic abuse (more than 200 grams daily assumption). The patient had not undergone surgery or dental extraction during the prior 6 months nor had he reported hospital admissions or medical invasive procedures around the same period.

Physical examination showed a 4 cm palpable hepatomegaly, 6 cm splenomegaly together with the presence of a moderate quantity of ascitic fluid in the abdominal cavity. There was abdominal tenderness at the left hypochondrium and around the umbilical region. Lower extremities were oedematous. Peripheral lymph nodes were not palpable. Chest auscultation revealed crepitations in the basal right lung region.
Laboratory investigations showed thrombocytopenia (40,000/mmc), anaemia (haemoglobin: 9 g/dl) and an increased leukocyte count (14,000/mmc with 80% neutrophils). Erythrosettimentation rate was 100 mm/hour and C-reactive protein was 14 mg/dl. Total bilirubin was 1.7 mg/dl; prothrombin activity was 55%; serum albumin concentration was 2.7 g/dl. Both serum hepatitis B virus surface antigen and antibody to hepatitis C virus were negative. Blood urea and serum creatinine were within the normal limits. Urine culture, rectal and pharyngeal swabs were negative. Four blood cultures taken at patient’s admission allowed to isolate *E. coli* sensitive to third generation cephalosporins but resistant to quinolones.

Dental, cranial and chest X-rays, colonoscopy, oesophagogastroscopy, otoscopy, transoesophageal echocardiography excluded any possible source for bacteremia.

The abdominal ultrasonography showed hyperechogenic hepatomegaly, increased diameter of portal and splenic veins, splenomegaly (18 cm longitudinally) with the evidence of a 6 cm-diameter hypoechogenic area in the spleen lower pole. Computerized tomography (CT) scan confirmed the presence of a single colliquative lesion with a diameter of 7.5 cm (Figure 1).

On the basis of blood culture results and antibiotic susceptibility reports, ceftazidime was administered at a dose of 6 grams/daily for as long as 21 days. At the end of the scheduled antibiotic round, the patient was apyrexial, the abdominal pain had disappeared and leukocyte count and erythrosettimentation rate were normal. The abdominal CT scan demonstrated a persistent spleen enlargement without any clear-cut evidence of polar abscessual lesion (Figure 2).

Three months later a clinical revision confirmed the absence of fever, the reduction of splenomegaly to less than 2 cm below the costal borderer, the absence of abdominal ascitic fluid and peripheral oedema. By that time, Child Pugh score was not modified in comparison with previous evaluation.

**Discussion**

Although Gram-positive cocci (*Staphylococcus aureus* and *Streptococcus pyogenes*) are most frequently reported as a cause of splenic abscess, several studies indicated the significant role of Enterobacteriaceae. Among Gram-negative bacilli, the following were the most frequently encountered pathogens: *Klebsiella pneumoniae*, *Escherichia coli*, *Pseudomonas species*, *Salmonella species*, *Proteus*.

In a recent large case series, different immuno-deficiency disorders were associated with the development of a splenic abscess. Immune-deficiency is also considered to be a poor prognostic
Splenic abscess due to spontaneous bacteremia

factor, responsible for high mortality. In the present report we describe a case of splenic abscess by *E. coli* in a patient affected with alcoholic liver cirrhosis. Both liver cirrhosis and alcoholic abuse are characterized by a number of immune defects such as altered phagocytosis, abnormal intracellular killing and depressed humoral immunity.

Furthermore, cirrhotic patients have an increased intestinal wall permeability which frequently allows viable bacterial translocation from gut lumen to mesenteric lymphatics and from here to blood circulation and to extraintestinal sites. This phenomenon is also related to intestinal bacterial overgrowth. Spontaneous bacteremia and spontaneous bacterial peritonitis are the main clinical consequence of bacterial translocations in cirrhosis. Aerobic Gram-negative bacilli (such as *E. coli* and *Klebsiella spp*) are most commonly involved in translocation. Certain strains of *E. coli* are particularly efficient in performing intestinal barrier translocation, due to their greater ability to adhere to the mucosal surface8-10.

Splenic abscess is a very rare disease diagnosed either as a localized site of infection (consequent to traumas or infarctions) or as a part of a generalized sepsis (arising from infective endocarditis or dental infection)3-6. In the present report no possible source for bacteremia could be hypothesized with the exception of a cirrhosis-related spontaneous bacterial translocation. Some Authors proved that in alcoholic cirrhotics the incidence of spontaneous bacteremia is higher than in cirrhotic patients with other ethiologies11-13. Nevertheless, as far as we know, this is the first report on a splenic abscess due to spontaneous bacteremia in a cirrhotic patient.

Chang et al2 found that patients infected with Gram-negative bacilli are prone to develop multiple splenic abscess and have a higher mortality rate than patients with Gram positive infection.

In the present report, imaging data resulted in a diagnosis of solitary splenic abscess. Actually, most splenic abscesses encountered in clinical practice are solitary, being this lesion quite hard to be diagnosed because of non specificity of symptoms4. To clinch the diagnosis, an abdominal ultrasound exam or a CT scan is mandatory14,15.

Some Authors2,14 claim that splenectomy and antibiotics administered according to drug susceptibility test as well as management of underlying disease are the method of choice for treatment of splenic abscess. However, other Authors16-17, in accord with our datum, suggested that prolonged treatment with appropriate antibiotics may result equally effective for a definitive cure.

In this report the drug susceptibility test documented sensitivity to third generation cephalosporins, but resistance to quinolones. The probability of a quinolone-resistant bacteremia is higher than 30% in cirrhotics receiving long-term quinolones for selective intestinal decontamination (which was not the case for our patient)18-20.

The diagnosis of a splenic abscess in a cirrhotic patient without any evident source for infection, should suggest the possibility of a spontaneous bacteremia by mucosal translocation of intestinal bacteria21.

References


