# Meningoencephalitis, pancytopenia, pulmonary insufficiency and splenic abscess in a patient with brucellosis

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## ABSTRACT

A complicated case of brucellosis with some rare features is reported. Brucellosis is a multisystemic disease. However, disseminated brucellosis with cerebral, pulmonary, hematopoietic and splenic involvement in an otherwise healthy patient is a rare event. In this article, we report a case of disseminated brucellosis who was initially diagnosed as myelodysplastic syndrome (MDS) and meningoencephalitis, pulmonary symptoms, and splenic abscess formation occurred thereafter.

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Brucellosis is an endemic disease in Turkey.[1] It is characterized by recurrent attacks of fever, sweating, fatigue and arthralgia particularly effecting sacroiliac joints, knees, ankles, elbows, and shoulders. The most common findings are hepatosplenomegaly and osteoarticular involvement. Less commonly, neurologic, cutaneous, genitourinary, pulmonary, cardiovascular systems might be involved.[2] Hematological complications can be presented as leukopenia, thrombocytopenia, anemia, pancytopenia and clotting disorders.[3] Neurological system may be involved either centrally or peripherally in approximately 5% of the cases. Diffuse encephalopathy/meningoencephalitis account for approximately half of the neuro-brucellosis cases while peripheral neuritis or radiculitis account for 20%.[2] Brucellosis can also lead to visceral abscess formation but splenic abscess in an acute case without endocarditis is uncommon.[4] Here, we report a case of brucellosis who was presented with myelodysplastic features at the beginning and neurological, pulmonary and splenic involvement accompanied in due course. It is worth reporting this case because although brucellosis is a systemic disease, these organ complications are rarely seen together.

**Case Report.** In February 2003, a 58-year-old woman working as a technician in a bacteriology laboratory was referred to Hematology outpatient clinic with the complaints of weakness and fatigue. The complete blood count showed pancytopenia with hemoglobin level of 9.5 g/dl, white blood cell count of 3,700/mm$^3$ and platelet count of 111,000/mm$^3$. The serum iron level was 15 mcg/dL, total iron binding capacity was 247 mcg/dl, and serum ferritin level was 258 ng/ml. Bone marrow aspiration and biopsy revealed dysplasias on megakaryocytic and erythroid series. The patient was diagnosed as myelodysplastic syndrome and folic acid and vitamin B12 treatment was initiated. After 2 weeks of therapy, the patient was admitted to the emergency room with persistent complaints of fever and fatigue. The findings of

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the physical examination were as follows: body temperature was $38^0$C and there were rales on basal part of the left lung. The chest radiograph showed peribronchial infiltration pattern. The patient was admitted to the Infectious Diseases Department and intravenous levofloxacin was administered empirically for the initial diagnosis of community acquired pneumonia. On the second day of hospitalization, the patient became lethargic and confused. Meningeal irritation signs were positive. Lumbar puncture (LP) was performed. Cerebrospinal fluid (CSF) pressure was 42 cm $H_2O$. Microscopic examination revealed 100 leukocyte/$mm^3$ (80% lymphocytes). No microorganism was detected on Gram's stain, methylene blue and acid fast bacilli (AFB) examinations. The biochemical examination of CSF showed; protein level of 105 mg/dl, glucose level of 15 mg/dl (simultaneous serum glucose level was 105 mg/dl), chlorine level of 113 mEq/L. Cerebrospinal fluid brucella tube agglutination test was positive at a titer of 1/10. The culture of CSF did not reveal any growth. Serum brucella tube agglutination test was positive at a titer of 1/1280 and 3 blood cultures grew brucella species on the fourth day of incubation. The bacteria was identified as *Brucella melitensis biovar 3*. Doxycycline 200 mg/day per oral, rifampin 600 mg/day per oral and ceftriaxone 4 g/day intravenous were started. Magnetic resonance imaging (MRI) of the brain revealed right temporoparietal, bilateral-frontal dural thickening, opacification, and widening of the third and left lateral ventricle. During the follow up, hyponatremia, hypocalcemia and hypophosphatemia were developed. Serum hyposmolarity and elevation of urine sodium excretion were detected in the blood and urine tests, which might be related to inappropriate antidiuretic hormone syndrome. On the tenth day of therapy, dyspnea, tachypnea, and respiratory insufficiency developed and the patient was transferred to the intensive care unit and mechanically ventilated for 5 days. Thoracoabdominal computed tomography (CT) revealed bilateral pleural effusion, atelectasis and a few millimetric hypodense lesions on spleen of which the largest was 8 mm in diameter (**Figure 1**). These splenic lesions were reported as abscess formations. Transesophageal echocardiogram was performed to rule out the possibility of endocarditis. No vegetation or valve defect was detected. Pleural fluid sampling could not be performed because of a probable complication (namely pneumothorax) since she was on mechanical ventilation at that time. The pleural fluid disappeared shortly after appropriate antimicrobial therapy. Her clinical condition began to improve after 3 weeks of therapy. Control LP which was performed after 8 weeks of therapy revealed

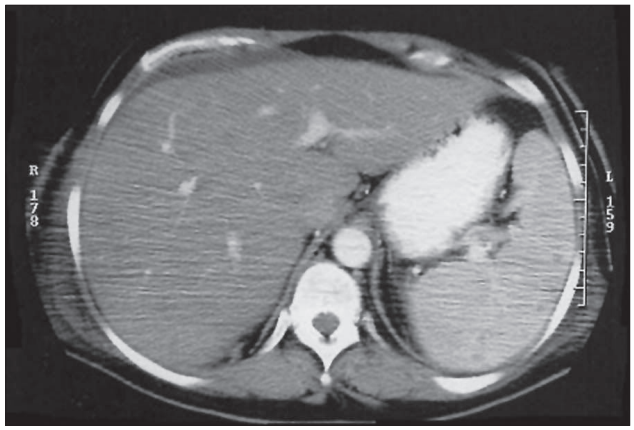


**Figure 1 -** Abdominal CT showing multiple hypodense splenic lesions of which the largest was 8 mm in diameter.

that; CSF pressure was 42 cm $H_2O$. No leukocytes were seen on microscopic examination and Gram's, methylene blue and AFB examinations did not show any microorganisms. Cerebrospinal fluid protein was 65 mg/dl, glucose was 43 mg/dl (simultaneous serum glucose 110 mg/dl), and chlorine level was 123 mEq/L. Cerebrospinal fluid brucella tube agglutination test was negative. The cultures of CSF were again negative. Intravenous ceftriaxone was discontinued and trimethoprim-sulfamethoxazole (TMP/SMX) 160/800 mg twice a day per oral was added to the treatment. The patient was discharged with the recommendation of doxycycline, rifampin and TMP/SMX therapy. After 3 months of therapy, another control LP was performed. Cerebrospinal fluid findings were normal. On control abdominal CT, the splenic lesions were disappeared. Her medical therapy was completed up to 6 months.

**Discussion.** Brucellosis is a multisystemic disease which is endemic mainly in the Mediterranean basin, the Middle East, India and South America.[1-6] Humans are infected through consumption of raw milk, cheese or meat, or through direct contact with the infected animals, the products of conception or animal discharges (especially among shepherds, farmers, and veterinarians), or through the respiratory tract (especially workers in abattoirs and microbiology laboratories).[7] Our patient was working in a microbiology laboratory in which there was no bio-safety cabinet. As there was no clue for another source of infection and pulmonary symptoms were the leading symptoms, it was suggested that the patient had acquired the infection during a contagious laboratory procedure. This case of complicated and possibly laboratory acquired acute brucellosis had some rare features; such as myelodysplastic syndrome

meningoencephalitis, splenic abscess formation and pulmonary symptoms requiring mechanical ventilation. These complications might be due to the invasive nature of *Brucella melitensis* infection rather than the route of entry of the microorganism into the body since *Brucella melitensis* is highly virulent and causes the most severe and acute cases of brucellosis with disabling complications.[8] Splenic abscess formation is usually detected in chronic hepatosplenic brucellosis. Splenic abscess as a complication of acute brucellosis is considered exceptional, with an incidence of no more than 2-3% in the largest series.[9,10] Although it is reported that surgical drainage is usually required in the treatment of splenic abscesses, our patient's splenic abscesses were smaller in size and improved with medical therapy only. Hematological abnormalities of mild anemia and leukopenia have been frequently associated with acute brucellosis. The incidence of pancytopenia varies from 3-21% in the published series.[7-9] Our case had a diagnosis of MDS after bone marrow biopsy and we could not find any other reported brucellosis case with hematologic features of MDS in the available medical literature Medline search. Brucellosis may present with disseminated organ involvement and should be kept in mind where the disease is endemic. Besides, brucella is a virulent and highly infectious agent for the laboratory staff and **b**iosafety level 3 precautions are warranted when manipulating cultures.[8]

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