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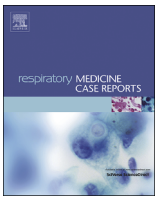

Case Report

Case report of pulmonary brucellosis complicated by pleural effusion

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ABSTRACT

Brucellosis is a bacterial disease and one of the most widespread zoonoses transmitted by an animal. It can affect any organ system, but pulmonary involvement is an unusual presentation according to the literature. We report the case of a 32 -year-old lady from Saudi Arabia who suffered from persistent fever and was found to have lobar pneumonia complicated by parapneumonic effusion. She started empirical antibiotics, and many investigations were done. In the end, after more detail about the patient's circumstances, the presumptive diagnosis of Brucella was made by high serology titer. She was effectively treated with doxycycline and rifampicin and completely recovered. In conclusion, pulmonary brucellosis is infrequent and challengeable in diagnosis but should be knowledge, especially in endemic areas of brucellosis.

1. Introduction

Brucellosis is a bacterial disease caused by many species of Brucella and is one of the most common zoonotic diseases. Humans usually get infected from direct contact, eating, or drinking products from infected animals. In endemic areas, human brucellosis causes serious public health consequences [1]. Brucellosis typically presents with fever, and fatigue, combined with body aches, sweating, and various unspecified signs and symptoms [2]. Focal complications are rare and can affect any organ including bone, liver, spleen, and heart. Pulmonary complications have been reported in 0.3–1% of patients with Brucella [3]. These complications include empyema, pleural effusion, granulomas and solitary nodules, interstitial pneumonia, mediastinum lymphadenopathy, military spreading, and even pneumothorax have all been reported [5].

The diagnosis of brucellosis can be challenging since its presentation and complication are like many infectious and non-infectious diseases, especially in an endemic area. The diagnosis is made by obtaining a tissue or blood culture, Brucella serology, or PCR assay [4]. The availability of tests and Knowledge of these tests are crucial for correctly interpreting the results in light of the patient's medical history and clinical presentation [6]. Therefore, the aim of this case report is to document the uncommon presentation of exudative pleural effusion with lymphocytic predominance in a healthy lady who underwent an invasive procedure to reach a final diagnosis.

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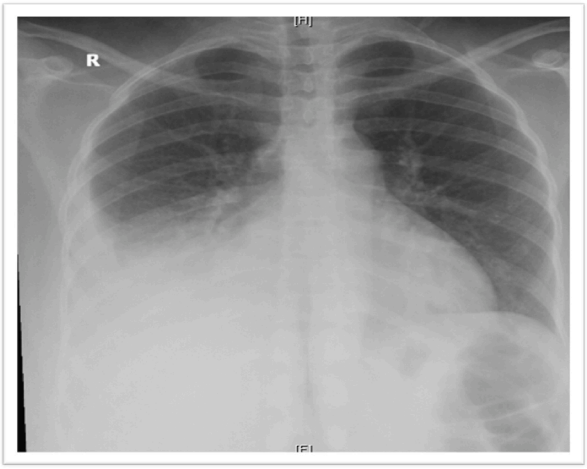

Fig. 1. (Initial chest radiography).

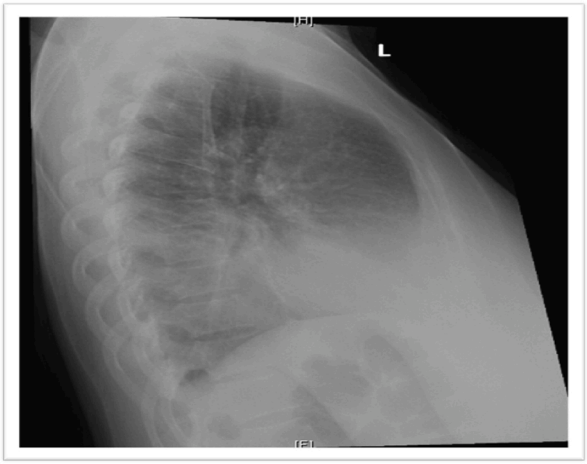

Fig. 2. (Initial chest radiography).

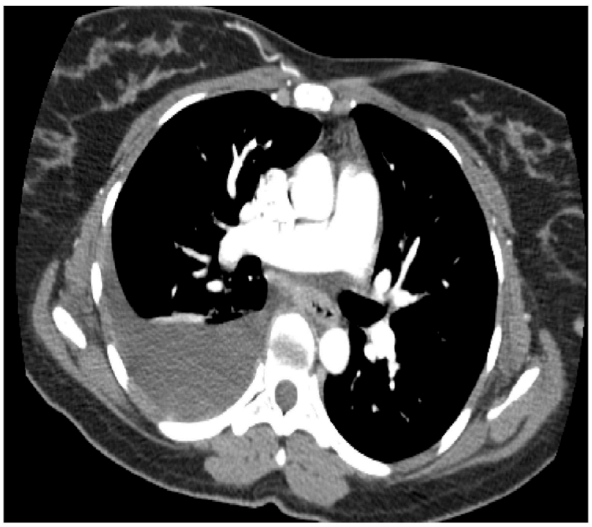

Fig. 3. (A spiral computed scan of the chest).

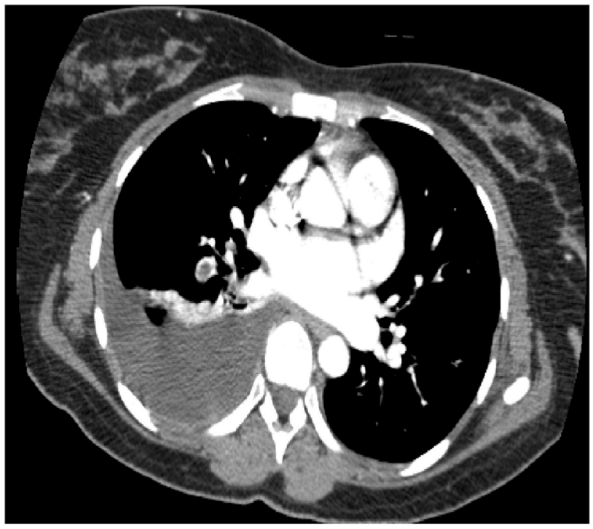

Fig. 4. (A spiral computed scan of the chest).

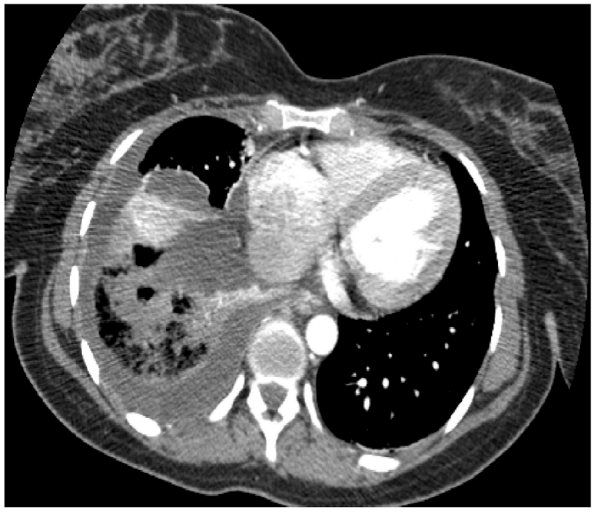

Fig. 5. (A spiral computed scan of the chest).

2. Case presentation

A 32-year-old married lady not known to have any chronic medical illness presented to the emergency department complaining of progressive shortness of breath and fever for the last two days. Associated with productive cough blood-tinged sputum and right-side pleuritic chest pain for the last five days.

She denied a history of weight loss or loss of appetite. No history of joint pain or swelling or skin rash. Other systemic review was unremarkable. No history of Tuberculosis or contact with a Tuberculosis person. Past medical history, she gives a history of admission to the maternity hospital two weeks back for termination of pregnancy due to intrauterine fetal death at the end of the 7th month of pregnancy which was terminated by cesarean section and needed close medical care for a few days till improved and discharged home. On physical examination, the obese patient looks pale. No jaundice or cyanosis. No clubbing, or enlarged lymph node. Vital signs: Temperature 38.6, pulse rate 120 beats/min. Respiratory rate 24 breaths/min., Blood Pressure 120/75 mm Hg and oxygen saturation was 98% on room air. On chest examination the Trachea was centralized and there is right infrascapular dullness on percussion with diminished breath sound on the same side. Cardiovascular, abdominal, genitourinary, and central nervous systems were all unremarkable. Initial laboratory investigation: Hemoglobin 9.4 g/dL (10.5–14.0), total leukocytic count 9.6 × 10 (6)/mL (4.4–11.0), platelets 635 × 10 (3)/mL (10–400). Coagulation profile, basic renal function, and liver function test within normal range. Inflammatory markers including C-reactive protein measured 1.6 mg/L (<5) and the Erythrocyte sedimentation rate was 63 mm/hour (1–20). Arterial blood gas interpretation was respiratory Alkalosis. ECG showed sinus tachycardia with a rate of 120/min. Initial chest radiography showed obliteration of the right costophrenic angle with underlying lung consolidation (Figs. 1–2). She was admitted with health-care-associated pneumonia and started piperacillin/tazobactam 4.5 gm Q 8 hours Intravenous, Levofloxacin 750 mg once

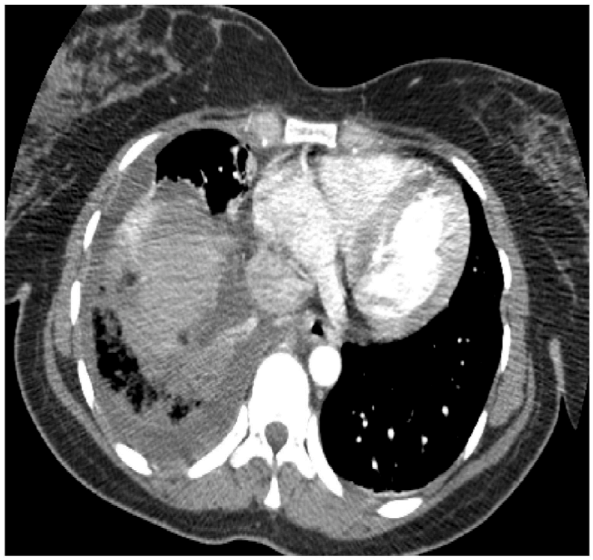

Fig. 6. (A spiral computed scan of the chest).

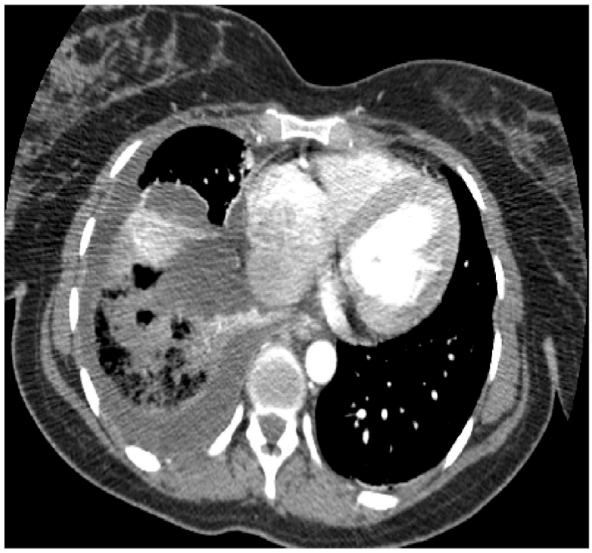

Fig. 7. (A spiral computed scan of the chest).

daily per orally, Paracetamol PRN and Enoxaparin 40 mg Subcutaneous once daily. On the second day of hospital admission, she became more dyspneic, had tachycardia, and require oxygen to maintain her oxygen saturation for that arranged spiral computed scan of the chest, Doppler lower limb, and echocardiography. Echocardiography was within a normal study and the Doppler lower limb showed no evidence of deep venous thrombosis, and a trial of bedside thoracocentesis under ultrasound guidance was also done but failed as the patient was non-cooperative. A spiral computed scan of the chest confirmed pulmonary embolism of the right segmental branch of the pulmonary artery with right pleural effusion with underlying lobe consolidation (Figs. 3–8). Therefore, an enoxaparin injection therapeutic dose was started as a management for pulmonary embolism, and a basic autoimmune profile including antiphospholipid antibody was sent as a part of the thrombosis workup. On the fifth day of hospital admission patient still documented high-grade fever and progressive cough. Septic screens including Sputum, blood, and urine culture sensitivity were all negative, also sputum Acid-fast bacilli and Tuberculosis - PCR with culture and autoimmune profile were negative. Follow-up total leukocytic count = 7.5 × 10 (6)/mL (4.4–11.0), neutrophil = 68.7%, lymphocyte = 22.8%. The gynecological team was involved to exclude underlying gynecological causes of persistent sepsis after the recent cesarian section operation and cleared from their side after an unremarkable ultrasound pelvis study. Follow-up chest x-ray showed the same obliteration of the right costophrenic angle with underlying lung consolidation (Fig. 9). Therefore, Thoracocentesis from right pleural effusion was taken under ultrasound guidance, and analysis was done (Table 1). The fiber optic bronchoscope done as a part of lymphocytic pleural effusion workup and bronchoalveolar lavage investigation were all negative for bacterial, fungi, and tuberculosis infection. The thoracic surgery was consulted and Video-

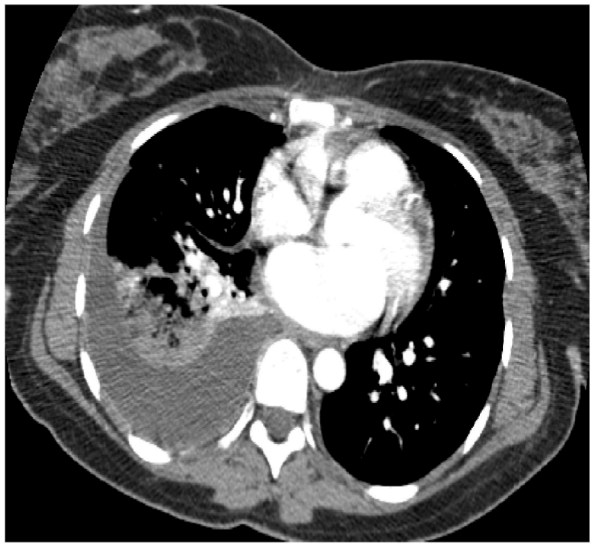

Fig. 8. (A spiral computed scan of the chest).

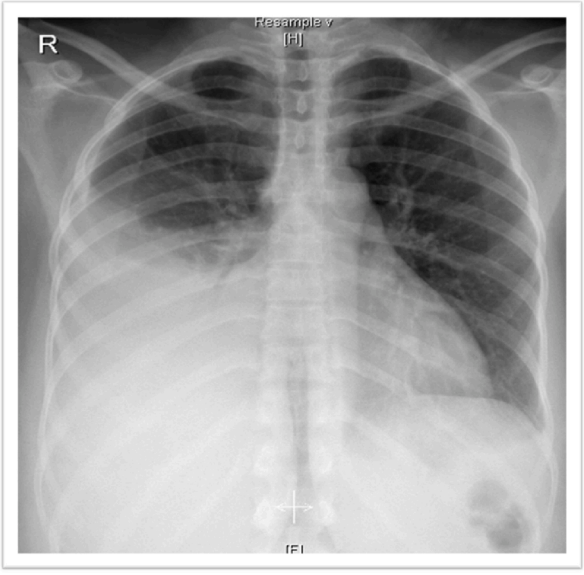

Fig. 9. (Follow-up x-ray on day 5th).

assisted thoracoscopic surgery done and showed a healthy pleura with a small area of inflammation and a pleural biopsy was taken. On the nine days of hospital admission patient still documented spikes of fever and a follow-up chest x-ray showed regression of right pleural effusion with underlying consolidation (Fig. 10). The primary team reviewed a more detailed history of the patient, and she gives a history of raw milk ingestion recently. Brucella serology was sent and the result was positive for Brucella melitensis titre = 1/320. Infectious diseases were involved and doxycyclin 100 mg twice per day and Rifampicin 600 mg once daily started. On day fourteen, she became afebrile and her respiratory symptoms improved therefore she was discharged home on the same regimen started in the hospital with follow-up in the clinic with pulmonology and infectious disease. After two weeks in the pulmonology clinic patient mention a significant improvement in her respiratory symptoms and the pleural biopsy report documented infected pleural tissues with no granuloma or malignancy seen in the submitted slide. After four weeks in the pulmonology clinic patient was doing well and a follow-up chest x-ray showed resolution in pleural effusion and consolidation (Fig. 11). The patient planned to continue her Brucella treatment according to infectious disease recommendations.

3. Discussion

Brucellosis is a bacterial infection caused by Brucella species. Direct and indirect contact with infected animals can spread the infection to people. The main source of infection in humans is the eating of raw milk and cheese prepared from it. It is the most preva-

Table 1
Pleural analysis.

Pleural analysis	
Appearance	Turbid
PH	7.4
Protein (gm/dL)	4.9
Cholesterol (mg/dL)	121
Lactate dehydrogenase (IU/L)	316
Cell count (/μl)	5000
Lymphocyte (%)	51
Neutrophil (%)	17.5
Monocyte (%)	20.2
Eosinophil (%)	4.5
Gram stain	negative
Ziehl- Neelsen for AFB	negative
Bacteriological culture	negative
MTB-PCR	negative
Cytology	No malignant cell

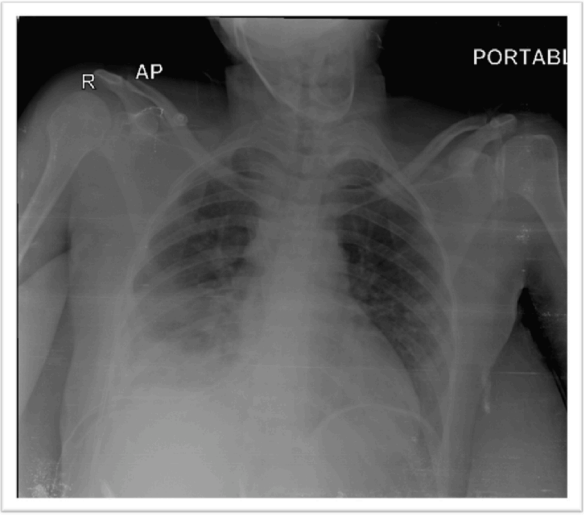

Fig. 10. (Follow-up on day 9th).

lent zoonosis in the world and a significant public health issue in many areas with inadequate resources [7]. Any organ can be involved in this disease, so it is necessary to have a complete history of exposure and clinical suspicion to avoid a delay in the diagnosis, as was in this case. Pulmonary complications are reported in 0.3–1% of patients with brucellosis. Pneumonia and pleural effusion are frequently observed [3]. In the literature, a variety of respiratory manifestations are reported in brucellosis. There is one descriptive study involving 131 patients in Turkey with respiratory manifestations of Brucella infection. The result was reported a consolidation and lobar pneumonia by 68 %, pleural effusion by 30 %, bronchitis by 17 %, and nodular lung lesions by 7 % [8]. Another retrospective study in Southeastern Europe describes 37 cases of respiratory brucellosis. 32 % of them presented with typical lobar pneumonia, 10% presented with pleural effusion, and 40 % presented with an interstitial pattern on the chest radiographs, and 5 % presented with hilar lymphadenopathy [9]. The diagnosis of human brucellosis is confirmed by a culture of the organism from blood, body fluids (urine, cerebrospinal fluid, synovial fluid, and pleural fluid), or tissue (such as bone marrow or liver biopsy) or a fourfold or greater rise in Brucella antibody titer between acute and convalescent-phase serum specimens obtained ≥2 weeks apart [10,11]. In situations where culture is not available or submission of two serology samples inapplicable, a presumptive diagnosis can be made by Brucella total antibody titer of greater than or equal to 1:160 by standard tube agglutination test (SAT) or Brucella microagglutination test (BMAT) in one or more serum specimens obtained after the onset of symptoms or Detection of Brucella DNA in a clinical specimen by PCR assay [4].

In our case a young lady who was admitted with healthcare-associated pneumonia complicated by exudate pleural effusion with lymphocytic predominant treated empirically by broad-spectrum antibiotic for ten days and failed to respond clinically and radiologically although basic septic screen, pleural culture, and bronchoalveolar lavage were negative. Detailed medical history especially exposure is crucial as happened in this case. Our patient underwent many investigations to find out the cause of persistent fever and respiratory illness despite a good coverage of antibiotics. As there is limited laboratory resource culture could not be obtained so a presumptive diagnosis of Brucella was made based on high Brucella titer result combined with persistent unrecognized etiology of pleural effusion. The treatment with doxycycline combined with an aminoglycoside or rifampin for three to six weeks is an acceptable

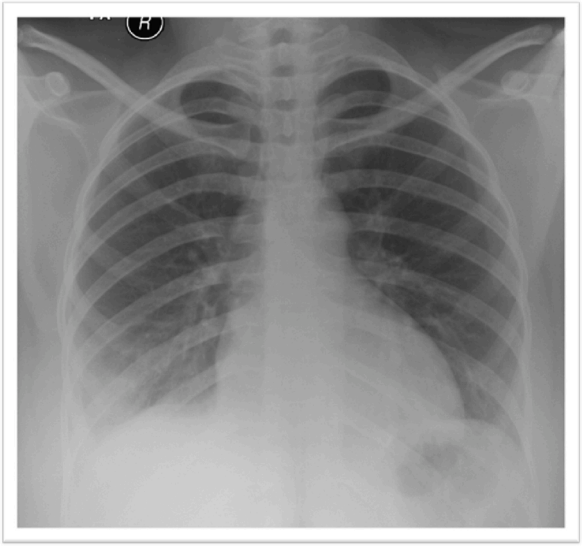

Fig. 11. (Follow up x-ray on week 2.).

approach and lesser relapse of infection compared to a monotherapy regimen [12]. This patient was treated with an oral regimen of rifampin and doxycycline for six weeks, her fever subsides within a few days, and her respiratory symptoms within two weeks.

In conclusion, in the differential diagnosis of individuals with persistent pleural effusions of unclear etiology, brucellosis should be considered, especially in endemic areas and with significant exposure history.

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Declaration of competing interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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