Brucella pleurisy: An extremely rare complication of brucellosis

Ahmad Alikhani[1], Hamideh Abbaspour Kasgari[1], Hadi Majidi[1], and Zahra Nekoukar[1]

[1]Mazandaran University of Medical Sciences

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Abstract

Brucella, a zoonotic agent is a rare pathogen of the lung. This intracellular organism can involve pleura in sub-acute and chronic course of the disease, and it should be considered in endemic area of brucellosis. Here, we present an extremely rare case of brucella pleurisy that referred with chest pain.

Introduction:

Brucellosis is an endemic disease in many developing countries and is a zoonotic infection of Brucella spp. mainly B. abortus and B. melitensis.[1] Contaminated dairy consumption or contact with an infected animal is responsible for infecting humans.[2] The variability in clinical presentations, including fluctuated fever, sweating, arthralgia, myalgia, back pain, and hepatomegaly, is commonly implicated in the differential diagnosis.[3]

Cardiovascular, respiratory, and nervous system dysfunction, hepatitis, and osteoarthritis are the most known complications of brucellosis. Although Zheng et al. reported that the incidence of respiratory involvement in brucellosis is about 13%, which may represent cough, pneumonia (or bronchial pneumonia), pleural effusion, pulmonary embolism, or even respiratory failure, most previous studies announced respiratory involvement as a rare complication.[4] Here, we present an extremely rare case of brucella pleurisy in a 40-year-old man with low-grade fever, arthralgia, and chest pain.

Case presentation:

A 40-year-old smoker man, presented to our clinic with low grade fever, arthralgia, and low back pain for several months. He was treating for brucellosis (with doxycycline and rifampin) from 7 days before this presentation, which was admitted for chest pain and dry cough. The lung auscultation revealed decreased breathing sounds and dullness in percussion in the base of right hemi-thorax. Cardiac examination was normal and there was no lymphadenopathy or organomegaly. There was a history of unpasteurized dairy product consumption and brucellosis in his father several years ago.

Chest X-ray (CXR) showed blunting of the right costophrenic angle (CPA) and in lung computed tomography (CT) scan, right pleural effusion without significant parenchymal infiltration was seen. [*Figure 1]*

Transthoracic echocardiography was normal. The level of the inflammatory markers were high [C-reactive protein (CRP): 38 mg/L (0-1mg/L), erythrocyte sedimentation rate (ESR): 115 mm/hr (<25 mm/hr)], and the platelet (PLT) count that was 502000/mm^3. Evaluation of rheumatologic markers were negative (wright test and 2ME were 1/320 and 1/160, respectively). [*Table-1*] Pleural effusion aspirated and analyzed as we showed the results in Table -2. The patient was treated for Brucella pleurisy with gentamicin (240 mg/daily/IV) and ceftriaxone (1g every 12hr / IV) plus rifampin (600mg per day, orally) for 2 weeks. After 5 days, he had no fever, and after 7 days, his chest pain and cough gradually decreased to disappear. Laboratory changes trend showed in Table-1. Medications also changed to oral formulations after 2 weeks with ofloxacin (300mg/daily) (intolerated to doxycycline) plus rifampin for 10 weeks. The patient was followed on 6 and 12

weeks after discharge and he did not have any complications and was improved completely. Lung examination became normal and he was unsatisfied for repeating imaging. Written informed consent was obtained from the patient for publication of this report. This study was conducted according to the declaration of Helsinki principles. Also, CARE guidelines and methodology were followed in this study.

Discussion:

The diagnosis of brucellosis with a wide range of nonspecific clinical presentations may last for months, as it occurred in our case, in which the specific therapy was started for him after several months of being symptomatic. The extended disease and inappropriate treatment may lead to even more severe consequences and some of the body system impairment.[5] On the other hand, responding slowly to the specific treatment is one of the characteristics of brucellosis, and this feature led to pulmonary manifestations in our case while he had been treated with effective medications for a week.

In addition to the common clinical findings in brucellosis, including fever, headache, malaise and weakness, myalgia, arthralgia, backache, and anorexia, some organs of the body may be affected like gastrointestinal, respiratory, cardiovascular, hematopoietic, and nervous systems.[6]

Andriopoulos et al. in 2007 investigated the presentation, diagnosis, and treatment of 144 cases of acute brucellosis. According to the data, no one exerted respiratory impairment features; however, osteoarticular, hematologic, or gastrointestinal complications were confirmed in many cases.[7]

The incidence of respiratory complications of brucellosis has been reported lower than 1 to 5%. The exact pathophysiology of this complication is not defined well. The most reported symptoms are fever, cough, dyspnea, sputum production, hemoptysis, and lymphadenopathy; and the most radiographic findings are interstitial pattern, lobar pneumonia, and pleural effusion.[8]

Studies showed that timely diagnosis and appropriate treatment result in a good prognosis. Hakan Erdem et al. in the largest series of pulmonary brucellosis in 2014 showed that the most symptoms of the patients were fatigue (87.2%), cough (85.7%), sweating (79.6%), lack of appetite (74.4%), and arthralgia (68.4%); while, our patient referred with chest pain, arthralgia, and low-grade fever. In that research, the most forms of pulmonary involvement were pneumonia, pleural effusion, bronchitis, nodular lung lesions, pulmonary embolism, ARDS, and surprisingly no pleurisy.[9]

To the best of our knowledge, there are three published case reports of brucella pleurisy, which all were completely recovered after treatment with rifampin plus doxycycline for a total of 8 to 12 weeks. There were also no radiological findings or relapses on their follow-up.[10-13] The same was happened to our case, except for the selected regimen according to the patient's intolerance, which was consisted of ofloxacin instead of doxycycline.

Brucellosis and tuberculosis (TB) often are endemic in some regions simultaneously. Since they are completely different in treatment strategies, it is important to differentiate the respiratory involvement of brucellosis from TB infection.[14] Of course, the presence of arthralgia along with the history of unpasteurized dairy products consumption can be considered to the detriment of TB diagnosis. Since Iran is an endemic region for TB, TB infection was ruled out for our patient with a negative MTB-PCR test. It should be noted that the pleural fluid adenosine deaminase (ADA) levels elevate in TB, and measuring ADA alone could not help to confirm brucellosis.[10]

Conclusion:

Brucella pleurisy is an extremely rare complication of brucellosis, even in an endemic region. The physician should always be aware of any symptom associated with respiratory involvement in a patient with brucellosis or with a history of the disease, because this complication may occur in the sub-acute phase of the disease. In the case of uncommon brucella pleurisy, effective management can result in both clinical and radiological improvement.

Conflict of interest:

Declared none.

Authorship contribution:

AA and HM involved in the interpretation and collecting of data and editing of the manuscript. ZN and HAK involved in drafting the first version of the manuscript. ZN involved in editing, and preparing the final version of the manuscript. AA is involved in critically revising the whole manuscript. All authors reviewed the paper and approved the final version of the manuscript.

Consent:

Written informed consent was obtained from the patient for publication of this report.

Availability of data:

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

Figure 1. Radiological findings showing pleurisy

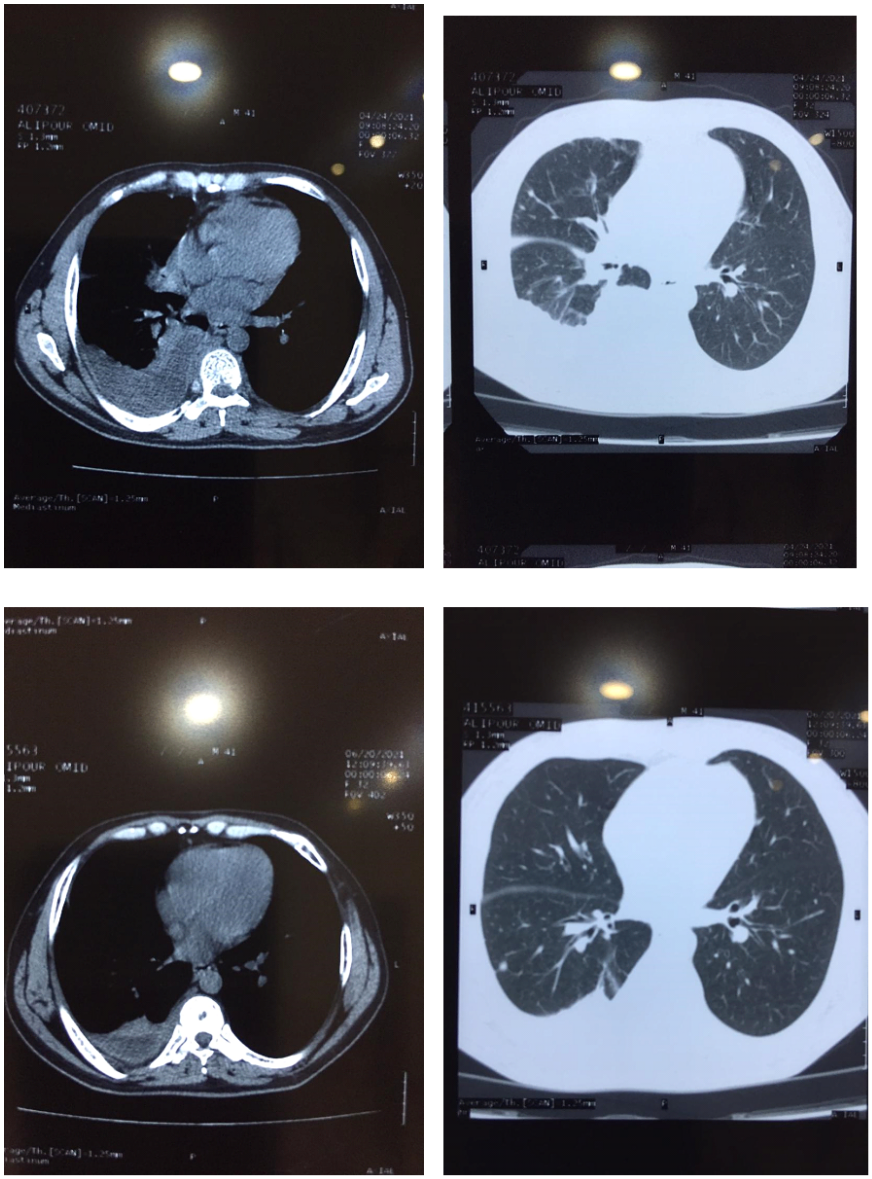

Table 1. laboratory data

Parameters	Baseline values	2 weeks after treatment	8weeks after treatment
WBC Count (/ µL)	20000	7200	-
PMN (%)	84.7	61.3	-
Lymph. (%)	6.5	31.2	-
Mono. (%)	5.4	4.8	-
Eos. (%)	3.4	2.7	-
Hb(g/dl)	4.3	13.5	-
PLT (/ µL)	502000	392000	-
ESR	115	85	-
CRP	38	20	-
Wright Test	1/320	-	1/160

Parameters	Baseline values	2 weeks after treatment	8weeks after treatment
2ME	1/160	-	1/80
Serum IDH	246		
Serum Protein	3.2	-	-
Covid-19 PCR on Nasopharyngeal swab	Negative	Negative	Negative

Table 2. Pleural Fluid Analysis

Parameter	Results
WBC (/ μL)	300
PMN (%)	30%
Lymph (%)	70%
RBC	4000
Glucose(mg/dl)	68
IDH(IU/L)	17.0
Protein(g/dl)	2.7
ADA(NL<30IU/L)	16
Wright Test Gram stain Bacteriologic culture Ziehl-Neelsen for AFB Cytology for malignancy	1/160 Negative No growth
Culture on Castaneda medium	No growth after 3 weeks
MTB-PCR	Negative

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