**CASE REPORT**

**Brucella haemorrhagic pleural effusion**

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**ABSTRACT:** *Brucella melitensis* (BM) is a rare respiratory pathogen. The lungs are usually affected in the subacute and chronic course of the disease, when pleurisy, empyema, hilar adenopathy, pneumonia and lung abscess have been described.

We present a patient with BM haemorrhagic pleural effusion, with low pH, low glucose and positive pleural fluid cultures.

Brucellosis should be considered in the differential diagnosis of patients with longstanding pleural effusions of unknown aetiology.

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Brucellosis, a common infection in Mediterranean countries, rarely affects the lungs. However pleural effusions, lymphadenitis and pneumonia have occasionally been described in subacute and chronic brucellosis infection [1]. We report a patient with low glucose, low pH, and haemorrhagic pleural effusion due to *Brucella melitensis*.

**Case report**

A 64 year old male farmer, who was a nonsmoker was admitted to the Pulmonary Department because of pleuritic chest pain in the right hemithorax during the last 15 days, dry cough, mild breathlessness on exertion for the last month, weight loss (15 kg) in the last six months, and malaise.

On admission the patient appeared well. His temperature was 36.8°C, blood pressure 120/80 mmHg, heart rate 75 beats·min⁻¹ and respiratory rate 20 breaths·min⁻¹. Clinical examination was negative, except for mild dullness on percussion and reduced breath sounds on auscultation in the right lower hemithorax.

Laboratory results gave the following values: erythrocyte sedimentation rate (ESR) 7 mm·h⁻¹; white cell count 7.4×10⁹·l⁻¹, with 51% neutrophils, 36% lymphocytes, 7% monocytes and 6% eosinophils; and platelet count: 363×10⁹·l⁻¹. Erythrocytes, creatinine, urea nitrogen, prothrombin time and liver functions were normal. Other findings were: lactate dehydrogenase (LDH) 295 U·ml⁻¹, protein value 77 g·l⁻¹ and glucose 5.43 mmol·l⁻¹.

Mantoux reaction was negative to 5 IU of human tuberculin purified protein derivative (PPD). Blood gases on room air were arterial carbon dioxide tension (Paco₂) 9.7 kPa, arterial carbon dioxide tension (Paco₂) 5.5 kPa, pH 7.43. Chest radiography revealed an encapsulated pleural effusion in the right hemithorax (fig. 1). Computerized tomography (CT scanning) did not show concomitant lung disease, except pleural effusion.

**Fig. 1.** - Chest roentgenogram shows moderate pleural effusion on the right side.

Diagnostic thoracentesis was performed and disclosed haemorrhagic pleural fluid with: haematocrit 7.3%, pH 6.93, LDH 740 U·ml⁻¹, and glucose 0.94 mmol·l⁻¹. Other findings were: protein level: 36 g·l⁻¹, and white blood cells 1.05×10⁹·l⁻¹, with 60% neutrophils and 40% lymphocytes. Gram stain for common bacterial pathogens and Ziehl-Neelsen for acid-fast bacilli were negative, and cytology was also negative for malignancy. Pleural biopsy performed by Abram's needle showed nonspecific chronic inflammation.

Fibroptic bronchoscopy was negative. Examination of bronchial washings was negative for common bacterial pathogens, fungi and mycobacteria, and also for malignancy. Cultures of pleural fluid 10 days later became positive for BM (by growth on TH10 broth). Serological studies of pleural fluid and blood subsequently confirmed BM infection: rose bengal test 3+; and immunoreaction Wright 1/2560. The final diagnosis was brucella haemorrhagic effusion.
Streptomycin, 1 g daily i.m., for 2 weeks and oxytetracyclin, 2 g daily per os in four separate doses, for 6 weeks achieved complete remission of the disease.

Discussion

This report illustrates a rare case of pleural haemorrhagic effusion, with low pH and low glucose, caused by BM.

Human infection by bacteria of the genus Brucella results from occupational contact with an infected animal, by ingestion of infected milk, milk products or tissues, or by inhalation [1]. Brucellosis may be asymptomatic with only serological evidence of infection. The manifestations of symptomatic brucellosis may be divided into acute, subacute and chronic brucellosis [2]. The symptoms are often nonspecific and include fever, malaise and weight loss, often without physical findings.

Worldwide, BM is the most frequent cause of brucellosis. There are great differences in the annual incidence of human brucellosis in different countries, mainly depending on the extent of animal brucellosis. The areas with the highest prevalence are the Mediterranean countries [3], Asia and Central and South America.

Acute respiratory manifestations from Brucella species are usually rare. However, brucellosis is often a prolonged and perplexing illness, and in chronic cases pleurisy, empyema, hilar adenopathy, pneumonia, bronchopneumonia, nodular lung lesions, lung abscess, peribronchial and peripheral "infiltration" are encountered [1, 4]. Pleural empyema has, however, been reported on at least 10 occasions, three of which had long-term course, whereas brucella haemorrhagic empyema has been reported only once [4].

Symptoms of respiratory involvement have rarely been reported. Nonproductive cough has been described in 10–33% of cases [5]. In one review of 59 cases, dyspnoea and pleuritic chest pain were present in six patients only. Hoarseness and, rarely, mucopurulent, purulent, or haemorrhagic sputum have been noted [6].

Histopathological confirmation of pulmonary brucella infection is rare; proven cases usually present necrotizing (caseating) granulomatous inflammation, similar to that seen in chronic tuberculosis [7].

A definitive diagnosis of brucellosis is made by recovering the organism from blood, body fluids or tissue specimens [8]. Although blood cultures are often positive in acute cases, they usually remain negative in subacute or chronic cases. Up to six weeks may be necessary to grow the organisms on appropriate media. In most cases, the diagnosis is made by a fourfold rise, or a single value of >1:160, in the agglutination titre [9].

Our patient presented an haemorrhagic effusion with low pH, low glucose, and positive pleural fluid cultures for BM, without gross pus or positive cultures for other pyogenic micro-organisms. By definition he should, thus, not be considered as having empyema, as had the patient recently described by Mili et al. [4]. Low glucose and low pH should be attributed to a large number of actively metabolizing pathogens in the pleural effusion, use of glucose and production of acid by leucocytes, and abnormal transfer of glucose, carbon dioxide and hydrogen ion across the thickened pleural membrane (fig. 2) [10].

Treatment with streptomycin for the first 2 weeks and tetracycline daily for 3–6 weeks has been the most effective therapy with fewest relapses [5]. Gentamycin has been successfully substituted for streptomycin. Experience with trimethoprim-sulphamethoxazole has been encouraging, with an extremely low relapse rate.

In conclusion, a serological and bacteriological search for Brucella melitensis should be mandatory for any pleural effusion of unknown cause occurring in a rural population, especially in countries where brucellosis is endemic.

References